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October, 1944



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BUTANE-PROPANE

OCTOBER—1944



BUTANE-PROPANE

News



Reg. U. S. Pat. Off.

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LETTERS

- Have you service or operating problems? Submit them to us and our technical department will endeavor to help you.—Ed.

Gentlemen:

We have recently adopted a policy of charging customers monthly demurrage on cylinders which have been at their premises over six months.

We would appreciate any information you can send us on systems or methods of keeping records on customers' cylinders for demurrage.

A. E. D.

Massachusetts

In reply to your query about customary demurrage charges in the liquefied petroleum gas industry, we can state that there is no universal practice in this regard. Some firms make a demurrage charge; others lease equipment on a monthly basis, and many include in their price of fuel their estimates of the cost of supplying customers with equipment.

An article appeared in *BUTANE-PROPANE News*, in the July issue upon this subject, Page 24.—Ed.

Gentlemen:

I am vitally interested in the liquefied petroleum gas industry when the war is over. If you can give any references relative to equipment manufacturers or a source of used equipment, it would be greatly appreciated. My interests are in a distributing system for a small town with a prosperous rural section adjoining, where individual installations could be made.

J. F. H.

Kansas

You will find among the advertisers listed in *BUTANE-PROPANE News*, the names of many firms who can supply you with the equipment you need. I particularly call your attention to

the ad on the back cover of the *Pacific Gas Corp.*

This firm is a distributing agent for the Gasair Corp. of San Francisco, which makes mixing and distribution equipment specifically for town plants.

Among other advertisers, you will find those who manufacture tanks, other equipment and appliances. Second-hand equipment is very hard to pick up, and probably your best chance to obtain what you need would be to place a classified ad in *BUTANE-PROPANE News*, in which you set out your exact requirements.—Ed.

Gentlemen:

I have been led to believe that every railroad tank car and every truck tank is equipped with an excess flow valve, and I would like to know if this is true and if there is any regulation to govern the maximum capacity of these valves for various parts of the country.

I note from the Handbook Butane-Propane Gases that the various size valves have a predetermined maximum capacity for a safe discharge and inasmuch as the discharge capacity of the valve has a direct relation to the size of the pump to be used for unloading, you can readily see the importance of having such information.

I have noticed that on some installations, the suction line goes down from the pump about 3 ft. under the surface, over to the railroad siding and then straight up to the dome of the tank car, while others go straight up from the pump and then over to the top of the dome of the tank car. It would seem to me, that inasmuch as the gas that will form in the pipe is much heavier than air, it will tend to settle in the lowest section of in-

stallation No. 1 and thus tend to create a vapor lock; while on the No. 2 installation, the gas will go direct to the pump, where it is easily bled out, or pushed out by the liquid. The latter installation has worked out better for me. There must be some good reason for the first installation. Could you give me that reason?

W. D.

Michigan

All tank cars are required to be equipped with excess flow valves and their size is determined by the ICC. Most cars have two discharge connections in the dome as the rate of unloading is restricted by the excess flow valve to such an extent that two connections are required to unload a car in a reasonable time. If the pump is operated at a rate greater than the capacity of the excess flow valves, they will close, resulting in the pump running dry.

All tank trucks should be equipped with excess flow valves or automatic shut-off valves. Usually the unloading rate from trucks is much faster than from tank cars.

Suction piping to the pump is all-important for successful operation.

Either method you outline is satisfactory if the size of the piping is sufficient to prevent pressure drop in the lines that will cause flushing due to reduced pressure at the pump suction. Often the lines are put under ground to insulate them from the sun's rays, especially if the suction line is long. The shorter the suction line with the minimum of bends, the better, and under no circumstances should the piping be made so that a trap is formed that will allow vapors to collect. Any combination of fittings that give two vertical risers and a run across the top will do this.—Ed.

Gentlemen:

Do you know where we may secure a calculator to size piping for butane and propane?

We are figuring a job now for propane that will require approximately three miles of piping, but inasmuch as this is only preliminary, we should have a calculator with which to work out estimates right in the field.

G. W.

Missouri

There is no calculator available that we know of that will work out this problem for you.

Distribution system design is an engineering

problem. The size of lines, the pressures at which to operate, and other functions are all interdependent upon one another.

This is covered in many engineering texts, one of the best being, "Gas Engineer's Handbook" prepared by the Pacific Coast Gas Association and published by McGraw-Hill Co., New York City.

The tables for natural gas flow can be corrected for LP-Gas by multiplying by a correction constant which is the specific gravity of the LP-Gas divided by the specific gravity of the natural gas for which the tables were calculated.—Ed.

Gentlemen:

In chapter 2 of the Handbook Butane-Propane Gases, Third Edition, it states that the main source of LP-Gas is the oil and gas well and that this supply is supplemented by certain refining processes. I read on page 46 of July BUTANE-PROPANE News that "LP-Gas is a by-product of the oil refineries and just so long as gasoline and oil are produced, the by-products will be proportionately available."

My question is this: Are there two separate sources of LP-Gas, as the Handbook says, or does the gas from both sources reach the distributor through the oil refineries? If the sources are separate, what proportion of LP-Gas comes from each?

J. T.

Maine

At the present time, about half of the supply comes from the wet gas at natural gasoline plants, and the other half from refineries. Before the present war, most of the production came from natural gasoline plants.—Ed.

Gentlemen:

Please tell me how many pounds of straight butane there are in a gallon. I buy by the gallon and sell by the pound.

F. W.

Missouri

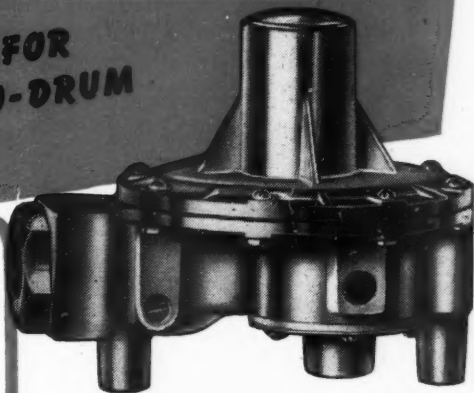
Normal butane at 60° F. weighs 4.8544 lbs. per gallon.

From this, you will be able to figure your costs and weights.—Ed.

FISHER'S

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ALWAYS THE FAVORITE FOR SINGLE OR TWO-DRUM REGULATION



Series 721 regulators are furnished with various inlet and outlet connections for single drum service or with double acting check valve cross "T" for two drum applications. They are designed to handle a capacity of gas entirely adequate for all domestic and normal commercial loads.

Features . . .

- All alloy metal die cast body and diaphragm cover, giving superior strength and pressure tightness.
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- Long, powerful valve leverage, plus large sensitive diaphragm area, assures extremely close pressure regulation.
- Pressure setting easily changed by removal of spring case cap.
- Regulator fully tested for operation, flow and leaks, before leaving factory.

Specifications . . .

Capacity—Suitable for loads up to 120 cu. ft. per hour or more.

Setting—11" Water Column at 30 cu. ft. per hour 100 lbs. inlet.

Inlet Connection— $\frac{1}{4}$ " to $\frac{1}{2}$ " pipe size and POL.

Outlet Connection— $\frac{3}{8}$ " or $\frac{1}{2}$ " female pipe thread.

Mounting—Cadmium plated steel foot screws and washers supplied with each regulator. Cadmium plated steel mounting bracket furnished on order at extra cost.

Fisher's series 721 regulators are still available in reasonable quantities. Orders can be accepted under the provisions of General Limitations Order L86 provided they carry priority rating of AA3 or better.



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Keep Competition Out!

By F. B. BOICE

Assistant Manager, Technical Products Department,
Shell Oil Co., Inc., New York City

THERE seems to be an apparent tendency on the part of some distributors of LP-Gas to restrict sale and installation of appliances either by state regulation or by discouraging retailers other than their own outlets from selling LP-Gas appliances, even to the point of refusing to install such appliances for those retailers.

While this course of action may, from some points of view, seem advisable, it is doubtful that any advantage gained will offset the many disadvantages which will accrue through such action.

When the war is over, and appliances are again available in quantities sufficient to meet consumer demands, thousands of retailers will buy and resell these appliances. A great many of these retailers are not, at the present time, and probably never will be, interested in supplying fuel for the appliances they sell, their only interest being in the appliance profit.

If these retailers cannot get LP-Gas appliances installed, their only recourse will be to sell appliances which consume competitive fuels. Since there will be many more appliance retailers than there are gas distributors, and providing these retailers cannot sell LP-Gas appliances, their clientele will be subjected to sales presentations which seek to convert them to appliances which do not use gas for cooking, water heating and space heating. Thus the purchasers of these appliances are lost to the LP-Gas industry for years to come and perhaps forever.

To offset these competitive influences, it would seem advisable that LP-Gas distributors encourage all retailers of appliances to sell appliances which burn LP-Gas, thereby materially reducing the number of competitors and at the same time increase the gas load of the industry.

This is not a new plan, for many utilities—both gas and electric—have used it for years, and it might be to the advantage of our industry to take a page from the book of these utilities in order to properly shape our market procedure.



F. B. BOICE
Guest Editor for October

DON'T BLIND YOURSELF TO THIS BIG MARKET!



**OVER 19,000,000
U.S. HOMES HAVE
NO CENTRAL HEATING**



**Smart Dealers Are Planning a Lot of Extra Postwar
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• When you contemplate the giant size of this market you realize it's right at your fingertips no matter where you may be located. It suggests that no postwar plan is complete unless it pays big attention to this really big market.

Here at Florence we're planning ways to help you get your share of it for extra postwar profits. Florence will offer among its line of ranges and heaters the most attractive and efficient Cabinet Oil Heaters your business has yet seen.

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"E" flies above our
Kankakee Shell Plant,
won by its workers.*

**FLORENCE
RANGES & HEATERS**

7! MAINLY BEYOND THE MAINS

By ELLIOTT TAYLOR, Washington Editor

Hold the Line

The grave view of the possible supply condition in butane taken by Paul K. Thompson, LP-Gas Chief with PAW, is not a matter that can be regarded lightly or even optimistically by the industry as it approaches the winter months. The figures on possible supply and on the industry commitments that indicate the winter demand were not picked out of a hat in Washington, but are the results of a painstaking survey undertaken and carried out by a committee of LP-Gas experts from within the ranks of the industry.

A questionnaire was circulated and returns that were subsequently tabulated represent the best available facts and opinions on the precise nature of next winter's problem. To the small dealers in butane, in particular, who are sometimes inclined to believe that the worst of the war



ELLIOTT TAYLOR

time gas shortage occurred last winter, and that it is in no danger of recurring, we have only this to say: The refiners who supply you with gas don't think so. The major distributors don't think so. The transportation companies don't think so. And the PAW doesn't think so.

Enlightened self-interest, as well as the sense of moral responsibility for the welfare of his customers that every butane dealer must feel, all dictate that the emergency recommendations made by the PAW, and based on the industry's own findings should be followed out. They are in brief: To get every container of butane full and keep it full as long as you possibly can. This applies to your own bulk storage as well as to the tanks of customers.

Get in touch with all of your customers and tell them to conserve on the fuel, and tell them how to conserve. Remember, the public is in the mood today to consider that the war is all in the bag, and that makes your conservation story harder to get across.

Those with suitable equipment should use propane in place of the more critical butane mix-

tures wherever possible. Those who are unable to use propane should accept mixtures of the maximum permissible propane content when offered them by shippers. No butane dealer should even put in a request for a new installation unless the new demand is of the most urgent nature, and one that cannot be handled by any other fuel.

It is hard for us to advise the industry to recommend a substitute fuel—just as hard as it must be for a dealer to follow such advice. But, we are aware that one customer service turned off for lack of fuel can do an incalculable damage to the future of LP-Gas in any territory. Once the impression gets abroad, carefully fostered by the competition, of course, that butane is an unstable and an undependable fuel, the operator in that area is in a worse position than he would be if his prospective users had never even heard of his gas.

In our opinion is it inconceivable that the industry will not be well on the way back toward its normal program of expansion by the time the winter of 1945-46 rolls around. The few months ahead are critical not only in the matter of the fuel supply, but in the matter of restraint that the industry will have to exercise just when the sunshine of better days appears close to the edge of the black clouds of war.

Upon the manner in which the butane segment of LP-Gas meets

the test of the winter of 1944 may well depend the public prestige and the confidence that it will enjoy for a whole decade.

Promising Publicity

The point made by Robert J. Canniff in speaking to the Southern Section, that a comprehensive publicity program is about the only group promotion that the industry can undertake at the present time, is worthy of more detailed consideration than it is likely to have when buried in a convention news report.

When the current publicity program was first proposed last year we limited our comments on the project to the observation that it was a good idea if properly handled. The Lawrence H. Selz Organization was a new name to us; it appeared at the time that they had been selected by someone to do the job even before the job was decided upon by the industry, which looked a little like logrolling by someone. And we were inclined to agree with those in the industry and within the ranks of LPGA that the method of financing the campaign was a little high handed, since it was accomplished by arbitrary assessments levied on the membership.

We are pleased to record here and now that in our opinion the campaign to date has been properly handled; it has been intelligently and soundly planned,

without resorting to the spectacular stunts with which publicity agents sometimes try to dumbfound and dazzle their clients. And the groundwork that has been laid, in the form of a complete national preparation and acceptance of material, presages success in the coming stages of the campaign out of all proportion to the trifling cost.

Deferring to the desirability of a democratic procedure understandably expressed by those who objected to special assessments, the Executive Board of the LPGA is now preparing to give the members a chance to vote on a proposal to raise the dues to defray the cost of continuing the campaign.

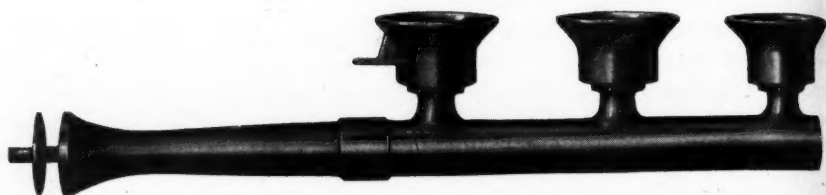
Frier McCollister, Selz organization executive who has been in direct charge of the butane and propane publicity campaign, has, in the course of his activity, contacted radio stations, weekly newspapers, magazine editors and special writers on home-making for rural publications.

The lack of knowledge and the apathy toward LP-Gas was appalling. The truth of the matter is that the electrical industry has so flooded all avenues of approach to the public attention with free material, and material of first rate editorial merit that any editor who followed the line of least resistance would just assume that outside of the solid fuels, electricity was the only answer to beyond-the-mains cook-

ing, refrigeration and water heating.

We can scoff among ourselves at electronics and some of the pipe dreams that the electrical prophets are blowing up for the public to look forward to. We probably won't live to see an electronic oven that will cook a meal in three minutes on an appliance within the reach of every purse. We may not even live to see an electronic oven that will cook anything outside of a laboratory technician's face. But so long as the stuff is being fed to the public they will wait a long time to see if the dream is going to be fulfilled before they will give up and be satisfied with LP-Gas, which they never heard of until an appliance salesman stuck his foot in the door.

And yet, as Mr. Canniff has pointed out, even if LP-Gas were ready to tell a complete industry story, and to spend the million dollars that would be necessary to do a fair job of national coverage without radio, the space in the national publications couldn't be bought. And then if the industry were ready to put up another million or more for a good radio program, the time on the air would not be available. So publicity is the only thing that is left. It is up to the members of the LPGA, and to those outside of that organization who should be members, to decide whether the story of the product that they will have to sell is worth telling to those who will buy it.



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The Ransome Commercial Heating Burner illustrated above is particularly advantageous because of its ease of installation, and the large capacity of the burner. Since all air for combustion is taken from outside the fire box, this burner maintains a constant combustion efficiency, regardless of fire box temperatures. This eliminates the heating of primary air, flash backs, candling on the orifice, sooting and stoppage of burners. Available in 5 sizes and operate on liquefied, natural, or manufactured gases. Inquiries are invited.

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Check Your LP-Gas Tank Trucks

By K. W. RUGH

Assistant Manager, Chemical Products Department,
Phillips Petroleum Co., Bartlesville, Oklahoma

TO those liquefied petroleum gas distributors handling delivery of gas in bulk, the tank truck is the most important piece of equipment in their operations and likewise the one that requires the greatest care in design, construction, maintenance and operation. The tank delivery truck is a bulk station on



K. W. RUGH

wheels—a gas main to the customer's installation. Scarcely any other piece of equipment in our industry's operations constitutes such an important combination of essential phases of liquefied petroleum gas distribution.

Recognizing this fact, one readily realizes the extreme necessity that the greatest care be exercised in designing, constructing and operating a liquefied petroleum gas delivery truck. This truck must carry a "bulk station" down the highway through "Main Street," and up a winding lane to the customer's back door. In traffic it is subject to all the variations of highway accidents. In the cus-

SUMMARY

The liquefied petroleum gas delivery truck is the industry's most important link in the movement of its product. This truck is a "bulk station" on wheels. It is essential that the delivery unit be equipped with safety devices to relieve any excessive pressure that may be built up within the tank or piping, but at the same time prevent any unwanted escape of liquid or gas through equipment failure.

Division III of the National Board of Fire Underwriters' Pamphlet No. 58 applies to containers and equipment for tank trucks for transportation of liquefied petroleum gas.

Some of the truck equipment items are described and a print showing the design of two typical delivery trucks is attached.

tomers back yard it must discharge its contents with its own power. At all times it must prevent its "pay load" from escaping to the atmosphere unless to protect itself it releases excessive pressure built up by some outside and uncontrollable influence. Not only must it perform this latter task under normal or safe conditions, but under abnormal or hazardous situations, as well—such as traffic accidents, fires, and equipment failures.

To perform these jobs it is essential that the tank truck and equipment be properly designed and constructed. The safety devices used must be adequate to

properly perform the functions for which they are intended. Because these safety devices seldom are called upon to function, the truck operator periodically should test their operation to assure himself that the condition and operability of these devices is satisfactory.

Division III of the National Board of Fire Underwriters' Pamphlet No. 58 applies specifically to containers and equipment for tank trucks for the transportation of liquefied petroleum gas. To facilitate a description of tank truck design in accordance with the standards set out in Pamphlet No. 58, two diagrammatic drawings of liquefied petroleum gas tank trucks have been reproduced on the attached sheet. Fig. 1 shows a truck having a tank with bottom outlet, relief valve in top of shell and all other openings in rear head of tank. Fig. 2 shows a truck with

tank that has all openings in the rear head.

These two diagrammatic drawings showing typical equipment on tank trucks are in themselves quite explanatory. There are some features, however, that perhaps deserve a fuller explanation.

As a general description of the piping, both trucks shown are equipped for loading directly into the tank, or through the truck pump should this latter procedure be necessary. Both trucks are also equipped with a by-pass differential regulating or relief device which discharges liquid from the pump discharge line into the tank should the pressure in the pump discharge become excessive. To relieve the pump and its power take-off mechanism when it is pumping into a closed discharge line, there is a manually operated quick-opening valve in a by-pass line



Delivery truck of the Philgas Department, Phillips Petroleum Co. This truck is equipped with all safety features required by the NBFU code.

around the differential pressure regulator. The pump driving mechanism can be disengaged by a hand operated lever located at the rear of the truck.

There is an excess flow valve in the discharge line just ahead of the hose connection and at a point where the piping is still rigidly supported, this rigid bracing continuing back to the pump. This excess flow valve is carefully sized to shut off the flow of liquid in case of a line breakage or hose failure beyond this point. There is also a precisely calibrated excess flow valve at the tank outlet. The tank truck loading connection is equipped with a back pressure check valve to protect against any failure in the filling hose.

How Excess Pressure is Relieved

The relief valve connected to the piping and shown in the drawing just in front of the tank is for the purpose of relieving any excess pressure built up in the piping when all line valves at the tank are closed. The suction line valve at the tank should be closed when truck is not loading or discharging. The truck is operated with a "wet" hose.

In Fig. 2, note that the moisture drain line from the bottom of the relief valve riser goes to the outside of the protecting ring. In case this relief valve discharges, vapor which would exhaust through the relief valve riser drain hole will thus be conducted away from the valve area within the protecting ring.

The relief valves exhaust freely

into the atmosphere through risers pointing in an upward direction. The risers have loose rain caps which are removed with the slightest exhaust from the relief valves. The rain caps are non-ferrous to prevent sparking.

Rear Bumper Protects Piping

The tank openings should be so arranged that the valves can be opened and closed by the operator when he is standing on the ground. The rear bumper on these trucks comes all the way around to the rear fenders to protect the piping. The layout of the piping and the installation of the pump should be arranged in a manner to protect against damage from collision. The safety of the driver should be carefully considered in designing these trucks. As an example, running boards should be lengthened or guards constructed to prevent slipping off the step into the spaces around the piping or pump.

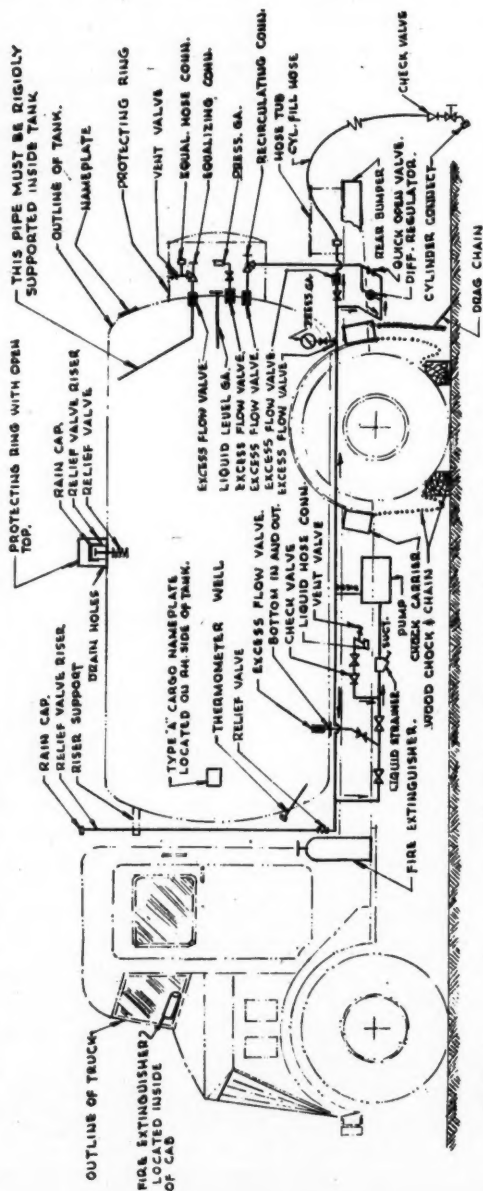
Periodic repair and inspection of the pump is necessary, and to facilitate this work it is well to install the pump in an accessible location, but as low as possible to give an adequate suction head.

Fire extinguishers should be tested at regular intervals and in the manner prescribed by the manufacturer. Some means should be set up in the operating records to make sure that these tests are made and recorded.

It is wise to make a thorough periodic check of your delivery truck equipment. You cannot be sure that all of its parts are in proper operating order if this is

20

BUTANE-PROPANE News



NOTES—Truck tank must be securely fastened to truck frame with side plates or by any other satisfactory method which will not permit any movement of tank while in transit.

Side and rear markings for Type "A" cargo tanks must be in accordance with the Interstate Commerce Commission Specification 7.6.

Plugs and electric fuses to be carried on a liquefied petroleum gas delivery truck must conform to various state requirements.



FIG. 2

NOTES—Running lights, side and rear reflectors, clearance lights, directional stop and tail lights, must be installed on each truck according to Interstate Commerce Commission specifications in regards to "lighting requirements of motor carrier safety regulations" as given in "Equipment Requirements for Motor Vehicles" as published by "National Highway Users Conference."

All wiring must be in accordance with the latest revision of the National Electric Code for Class 1, Group "D" locations. Individual state requirements may vary. Such requirements are determined and changes made at assembly.

not done. Philgas Division of Phillips Petroleum Co. over a period of years has developed a rather thorough "check chart" for liquefied petroleum gas tank trucks. You can obtain a copy by writing to them.

It is recommended that liquefied petroleum gas distributors have their tank trucks examined and listed by one of the authorities as described in Pamphlet No. 58. And again it is urged that all tank

truck operators review Division III of Pamphlet No. 58. This Division applies to tank trucks, and its review is an essential to acquainting every operator with the standards for the design and construction of a safe and efficient tank truck—"a bulk station on wheels," and the most important link in the movement of these inflammable, volatile, high-energy-containing and most useful liquefied petroleum gases.

WPB Krug Promises Quick Conversion

ACTING Chairman J. A. Krug, of the War Production Board, announced Sept. 5, following a meeting of the full board, that the army, navy, and major war agencies have unanimously agreed on a program designed to provide the utmost stimulus to reconversion when Germany is defeated, while at the same time, protecting production necessary for the Japanese war.

Acting upon findings that there will be a reduction of about 40% of war production within three months after the defeat of Germany which will free over 4,000,000 workers, the Board decided to:

1. Remove almost all controls over materials immediately upon the defeat of Germany except those that are absolutely necessary to assure the reduced measure of war production necessary to beat Japan. This means that all manufacturers can use any plant and any materials that are not needed for military production for any civilian production.

2. To assist and encourage industry in resuming civilian production and maintaining employment through the "know-how" of its industry divisions and industry and labor advisory committees.

3. The Board will maintain its organization and powers so as not to relinquish authority until it is certain that the war production program is adequate for victory over Japan.

Industry is to be allowed in its own way, according to the availability of markets, men, materials and plants, to do the swiftest and most effective job possible of restoring production, making whatever people want and affording maximum employment, just as quickly as possible.

There will be only one preference rating, in addition to the present emergency AAA rating, and this rating will be reserved exclusively for military programs during the war against Japan.

After Germany's collapse no programming of civilian production will be necessary.

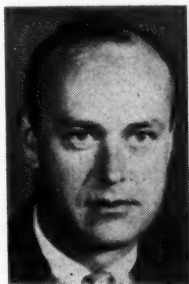
Propane Plays Important Part in Midwest Heat-Treating

By GEORGE W. GRAY

Assistant Vice President, The Verkamp Corporation, Cincinnati, Ohio

THE art of heat treating has progressed rapidly since the days when all hardening and tempering was done by the blacksmith in the forge. No longer does the operator peer into the furnace to see if the steel is a proper cherry red and to make sure that the atmosphere in the furnace is smoky enough so that the steel is not too badly scaled or decarburized. A scratch with a file is not sufficient to test hardness results today when all heat treating specifications call for narrow ranges of Rockwell, Brinell or Scleroscope readings.

In order to be adequately equipped to handle the average run of work, the commercial shop should have available at least four basic types of furnaces. First, the semi-muffle oven type for annealing, pack carburizing and general hardening; second, the full muffle type using specially prepared at-

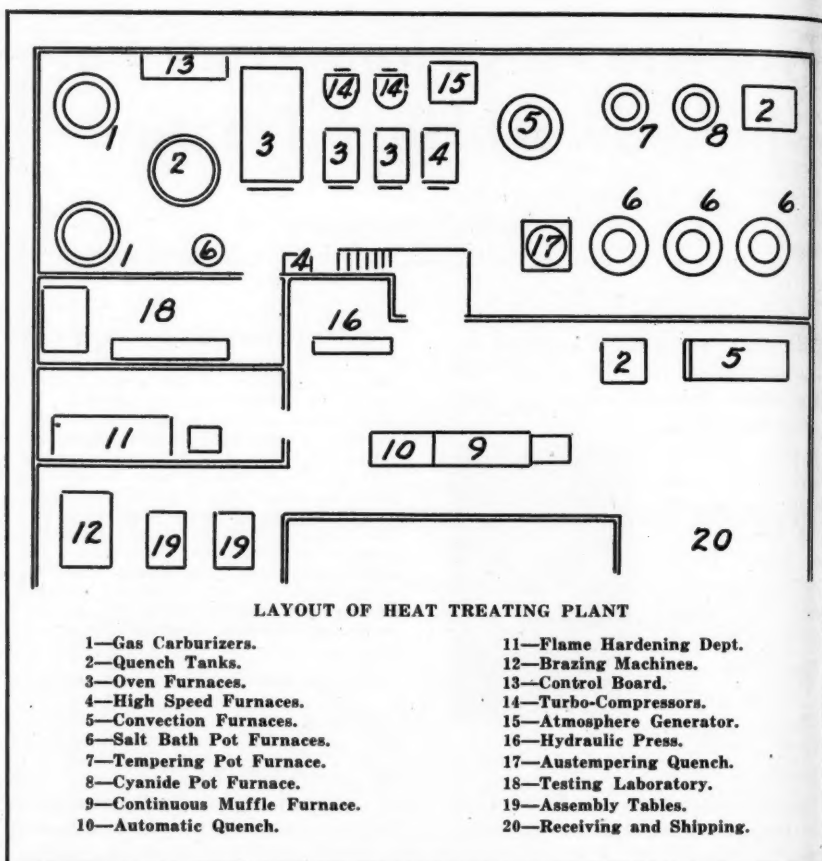


G. W. GRAY

THE RAPIDLY-INCREASING practice of applying liquefied petroleum gas to industrial operations should arrest the attention of dealers and distributors. It, with commercial and chemical uses, bears promise of equaling, or even exceeding, the domestic market for this premium fuel, and those who are alert to opportunities for these large loads in their localities can greatly augment their sales. The Verkamp Corp. has been a large distributor of LP-Gas in the Midwest for many years. It is significant that this experienced firm has established its own heat treating plant in which propane performs an important function.—Editor.

mospheres for clean hardening, clean annealing, and gas carburizing; third, the salt bath pot type for neutral salt clean hardening, liquid carburizing, cyaniding, lead drawing, and tool steel nitriding; fourth, the convection type, wherein the heat is transferred by a blast of heated air circulating at high velocity producing fast uniform heating. These units are used for tempering, stress relieving, annealing of copper and brass, and for the solution treatment of both cast and sheet aluminum alloys. Many of these basic types are available in continuous or automatic designs and for various ranges of temperatures.

A well equipped shop will also



have flame hardening, electric induction heating, and flush or press quenching equipment for handling the more particular work.

In addition to the furnaces, accurate indicating or recording controls are required as well as large quench tanks for oil coolers, hardness testers, degreasers and sand blast equipment.

The position of the commercial heat treater is an extremely responsible one. The importance of

this operation is equal to that of machining and other forming operations, but the subject is so technical that it can best be handled by the specialist. The hardening and tempering operations usually take place after all forming work is completed and only the finish grind remains. This means that the customer risks not only his material but also considerable value in man-hours. A manufacturer sending work to a commercial heat treater

shows his confidence that the pieces will not be returned as scrap.

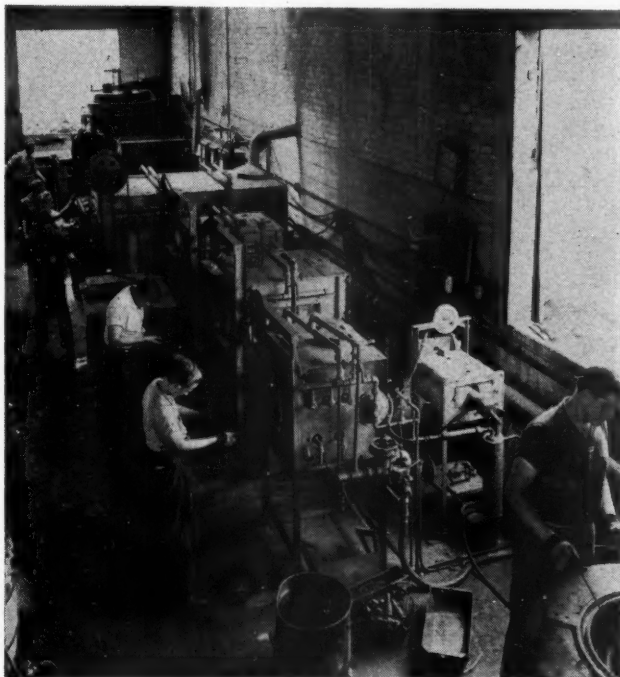
The metallurgy of alloys has been widely covered by text books and periodicals, but their heat treatment, which involves the handling of the material in bringing about the required metallurgical changes, is an art, and is learned only through practical experience.

Heat treating cycles involve time as well as temperature, and are governed by the size and shape of the piece, the alloy composition of the material, and the physical properties desired. There are two prime purposes in hardening steel.

One is to raise the yield point and tensile strength by hardening the piece throughout, the other is to increase the wear resistance by hardening only the surface. In carburizing an item such as a shaft or gear made of low carbon steel, the piece is exposed to gases composed primarily of CO and CO₂ which raise the carbon content of the steel near the surface to depths of from .010" to .125" as required. Thus, after hardening, the piece will have a tough core for strength, since the low carbon steel is not appreciably hardenable, and an extremely hard case at the surface for wear and abrasion resistance.

An interesting fact has been

▲
Oven furnace
department.
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brought out in connection with our heat treating operations, correcting a popular misconception. Hardening a piece of steel does not stiffen it; that is, the modulus of elasticity, the ratio of stress over strain, 30,000,000, remains unchanged. In other words, a square inch section of steel will deflect one-thousandth of an inch under a force of 30,000 pounds no matter how hard the steel. The tensile strength, however, which is the ultimate stress that the steel can withstand, increases as a function of the hardness. The yield point, elongation, and reduction of area are also greatly affected.

The main underlying principle in heat treating is not the heating but the *rate of cooling* from the heat. If a certain *critical rate of cooling* is exceeded in the quench, the austenitic solution will transform into martensite which may be tempered by subsequent reheating into the various intermediate stages such as sorbite, troostite, and pearlite, respectively.

Critical Cooking Rate Varies

The critical rate of cooling varies with the temperature level and also with the alloy composition of the steel. Alloys, such as chromium and nickel tend to lower the critical rate, making it possible to obtain full hardness by quenching in oil instead of water. This is highly desirable because the reduced thermal shock lessens the internal stresses which bring about distortion and cracking. Time-temperature-transformation charts are now available for many of the alloy steels. These charts plot the time

in seconds on a logarithmic scale against the temperatures from the critical on down, so that the time of transformation and the critical rate of cool are shown for the various temperatures as quenching progresses.

We make constant use of these charts when austempering and martempering. These cycles involve quenching into molten salt at elevated temperatures to reduce distortion to a very low point. Certain steels, such as the high carbon-high chromium die steels, have such low critical rates of cool that cooling in air will give them full hardness. This is a very desirable condition where irregular die shapes cause uneven stresses.

Salt Bath Gives Protection

One feature of our Heat Treating Division is the salt bath department with a capacity of 17,000 lbs. per day. Certain types of work must come from the heat treat without scale or decarburization. Since atmospheric air at 1550° is highly corrosive, the steel must be protected from it. Immersing the work in molten salt to heat it gives it this protection as well as fast heating.

Similar protection is obtained in the full muffle furnaces in our gas carburizing department. Here a special atmosphere is generated by cracking mixtures of propane and air at 1800° in a pitch-coke filled retort. The gases then pass through a cooling unit where moisture is condensed out, and then through a drying filter before being introduced into the muffle. Gas carburizing is produced by a similar proc-

ess. The interaction of the various gases is very complex, and space does not permit going into more detail regarding their use in connection with our operations. The gas carburizing department has a capacity of 3000 lbs. of steel per heat. Heats often run 30 to 40 hours in the instance of a cycle anneal or when a deep case is required.

The oven furnace department consists of six furnaces of various sizes. One of these, for hardening high speed steel, operates at approximately 2200° F. This tem-

perature is near the melting point of the steel, and sharp, delicate tools can remain at this heat only a few seconds before excessive grain growth occurs, resulting in brittleness. Protective atmospheres are also used in this furnace.

The convection furnaces circulate heated air at temperatures up to 1300° F. around the work, giving fast and uniform heating. One of these furnaces has an internal capacity of 36 cubic feet. Despite its high carbon content, the propane burns cleanly without soot deposit when burners are properly



Part of salt bath furnace line.

When Peace Comes V



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Will Be *Grand*

product may be the world's best, but its success depends largely on the strength of distribution. So, in addition to planning a postwar Grand Gas Range, an outstanding distributor network has been organized, with a list of names that reads like a "Who's Who" of appliance merchandising. This basic groundwork will assure GRAND dealers of quick delivery of ranges, quick service on parts, constructive merchandising help, and a smooth-gearred working relationship for profitable postwar business.

Grand

GAS RANGES

GRAND HOME APPLIANCE COMPANY • CLEVELAND 4, OHIO

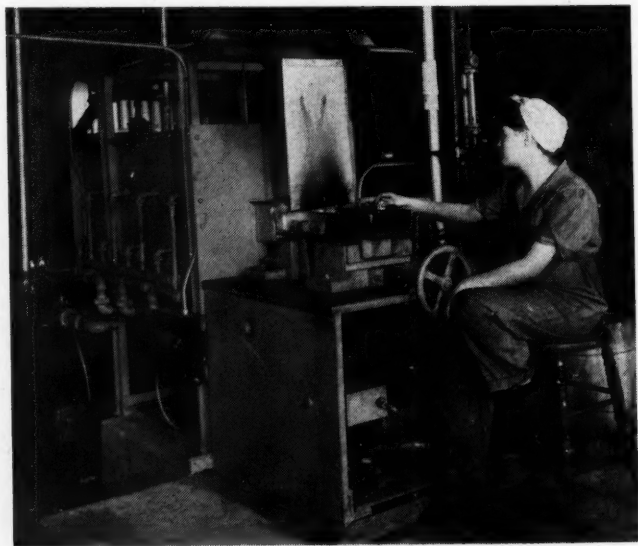
adjusted. This is important in the solution treatment of aluminum alloys which tarnish readily.

The flame hardening department is the most versatile of all, but relatively few types of work can be done in this manner. In one instance, however, where it was necessary to harden selectively a large number of small pins, an output of 18,000 per day was obtained, tripling the maximum capacity of the salt bath furnaces for this type of work.

Since it is very difficult to secure accurate temperature readings during the process of flame hardening where often the surface only is heated, the elements of time and flame temperature must be carefully balanced. An automatic feed using a synchronous electric motor for uniform speed is essential, and provision must also be made for speed adjustment.

The oxy-propane flame produces very fast heating without danger of violent backfire which sometimes occurs in the case of oxy-acetylene. The steel to be treated should generally not exceed 1600° F. and since the oxygen-gas flame can easily reach double this value, a stoppage in the feed mechanism would cause the work to be melted in a few seconds' time.

In flame hardening heavier sections, the temperature rise of the interior of the part will lag behind that on the surface, depending on the heat conductivity of the material. Thus, there is danger of overheating the surface, and the use of lower temperature flames such as propane-air is recommended. High pressure propane burners using air at atmospheric pressure are economical to set up and produce a safe maximum of approximately 1700° F. It is diffi-



▲
Hardening spring
steel in continuous
furnace.
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cult to confine these flames in small areas, however, and they are recommended only where the work is very small and fuel economy is no problem.

In order to conserve chromium and nickel the National Emergency steels have been widely used to replace the SAE types. Not only do these steels vary greatly from each other as to hardenability, but they also vary greatly from heat to heat. Special hardenability tests and grading methods have helped immeasurably in enabling us to obtain results within Army and Navy specifications.

The use of molybdenum as an alloy to conserve critical tungsten in many of the tungsten-chromium-vanadium high speed steels has made it doubly important to control atmospheres to avoid decarburization.

The propane fuel is drawn directly from one of our tank-car-capacity storage tanks and reduced to 20 lbs. pressure. This pressure is again reduced to 8 in. at the meter for use in the furnaces, most of which utilize solenoid-operated, single-valve controls. Gas

is fed through a zero regulator into an air-jet venturi. The air flow is controlled by an automatic input throttle connected to the instrument. Thus, a constant air-gas ratio is maintained at all stages of turn-down, including the pilot setting which operates at $\frac{1}{4}$ -in. manifold pressure.

The automatic input throttles are set manually for high input at the start of a heat. When the furnace comes up to temperature, the unit automatically switches to a lower maximum flame. From this point on, control is carried on between the lower maximum and pilot flame, thus securing closer control and thus avoiding danger of overshooting. This is, in effect, a three-position control and has proven very efficient.

Total propane consumption is approaching a tank car per month, and we find the fuel economical and clean. Our own operations with propane have given us much valuable experience in its use, and experience gained has placed us in a position to lend assistance to many users of propane.



Filling cylinders in rural district from one of the delivery trucks of the Verkamp Corp.,

Southern Section Men Urged To Hold Butane Supply Line One More Winter

THE Southern Section of the Liquefied Petroleum Gas Association drew close to three hundred members and observers, mostly from the butane side of the industry, for its two-day wartime conference in the Roosevelt hotel, New Orleans, Sept. 11-12. Regulation, including state as well as emergency government controls over the industry, safety, and postwar planning, were the three main topics of consideration, and practically all of the scheduled addresses, as well as the formal and informal discussions in bedroom, bistro and ballroom, were concerned with some phase or other of these pressing problems.

Paul K. Thompson, chief of LP-Gas in PAW, led off the first day's meeting with his remarks on "Will

We Weather the Winter," discussing the butane supply situation from the PAW point of view. Taking into consideration all factors, the known, the uncertain and the unknown, he advised his auditors that their only safe course was to prepare for a shortage of butane during the winter peaks. Specific steps recommended were to:

(1) Enlist consumer cooperation in conserving gas; (2) fill consumer storage and keep it full even at the expense of extra trips; (3) keep bulk storage full; (4) utilize propane in place of butane wherever possible; (5) accept maximum permissible propane content in mixtures; (6) keep local ration board advised of critical problem; (7) classify consumers in order of proper preference if cut-offs are necessary, with domestic con-



▲
Kenneth Koach, Green's Fuel, Inc., Sarasota, Fla., past chairman of Southern Section; Paul K. Thompson, Chief, LP-Gas Section, PAW, and Louis Abramson, Jr., Petrolane Gas Corp., New Orleans, president, LPGA.
▼

sumer first responsibility; (8) don't ask to connect new gas load if your producer is unable to certify it.

Other speakers from the government side of industry control included Osher Goldsmith, a fuel price specialist from the OPA, who covered in a general way the familiar story of the necessity for price control to prevent inflation, and Van F. Leach, who explained stove rationing, holding out the hope that it may not have to continue much longer.

State Control is Debated

State control was the subject of an interesting innovation in the form of a Questions-and-Answers session, held on the second day, at which representatives of four state regulatory bodies, having jurisdiction over LP-Gas installations, answered questions shot at them from all sides. The state officials who were thus willing to be put on the spot were: W. U. Moss, Sr., director of the Louisiana LP-Gas Commission; J. D. Newcomb, of the Arkansas state boiler inspection division; H. O. Bailey, Mississippi butane inspector, and Gus J. Strauss, director of the Texas Railroad Commission.

Assisting the officials in supplying answers that they might consider outside their several fields, were two technicians from the industry, Walter H. Hoagland, chairman of the LPGA technical and standards committee, and Louis Abramson, Jr., president of the national association. J. Woodward Martin acted as moderator for the session, asking the questions previously submitted and directing the discussions into profitable and objective channels. It was interesting to observe that one question frequently appearing in various forms was, what constitutes a model state control law?

Safety practices recommended in the handling of LP-Gases were covered in a paper prepared by Col.

George A. Burrell of Atlantic States Gas Co., chairman of the safety committee of the LPGA, and read in his absence by Committeeman H. Emerson Thomas. Chairman Burrell's approach to safety is through the medium of plans enlisting employee cooperation. He has gathered information on safety practices from many companies in the industry and this information is being mailed out to association members as fast as it can be correlated.

In the general safety discussion that followed the Burrell paper, A. N. Kerr, of Imperial Gas Co., Los Angeles, released some information he had compiled relative to the causes of accidents, in the past four years. His figures, taken from newspaper clippings over that period, show that 62% of LP-Gas accidents were due to or in connection with, bulk trucks, 19.6% were caused by lines and valves, with the other 18.4% distributed over many miscellaneous causes. Mr. Kerr



Walter H. Hoagland, Fisher Governor Co., Marshalltown, Iowa, chairman, Technical and Standards Committee, LPGA, and J. Woodward Martin, Stargas Department, Lonestar Gas Co., Dallas, Texas.

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contends that the industry worries too much about the type of accidents that never happen, such as bursting cylinders and tanks, paying too little heed to the danger factors, which have to do with transporting and handling before the gas reaches the consumer's premises.

Other speakers who paid passing tribute to the efforts of the industry on safety, included James I. Smith, member of the staff of the Governor of Louisiana, who observed, in his Monday luncheon address, that in that state, with approximately 30,000 LP-Gas customers, there had not been a serious accident reported since the formation of the state LP-Gas Commission in 1942. Thus he associated with the fact that in that period there had also been not one single major infraction of the safety regulations as laid down by the commission.

After-the-War Talk

The third and predominating subject of the two days of deliberations was that of postwar plans, including sales possibilities for the industry, advertising, publicity and all of the many ramifications of butane and propane promotion.

Ellsworth L. Mills, of the Bastian-Blessing Co., Chicago, led off the postwar discussion with a broad preview of the immediate and the long range possibilities of industry expansion at the conclusion of the war in Europe. His immediate advice to dealers: Act now in formulating definite postwar plans, but keep the set-up flexible enough so that it can be changed as conditions change.

The two prime problems of butane and propane will be government interference, which the speaker believes we will have to tolerate in some degree for a number of years, and the availability of the gases. In the latter respect he suggested that while there



D. D. Purrington, Standard Oil Co. of California, San Francisco, and Selwyn Turner, National Butane Gas Co., Mobile, Ala., vice-chairman, Southern Section, who presided at all sessions.

will be heavier demands for LP-Gases as hydrocarbons, there will still be an ample supply available for fuel to permit wide industry expansion.

The increased value of butane for other than fuel purposes, however, will result in higher prices at the refinery, and this in turn may possibly mean an increasing swing to propane for domestic consumption. He sees a possibility of the industry doubling its present output in one postwar year, under favorable conditions.

Mr. Mills also urged that the industry study population shifts and housing trends—the tendency of city inhabitants to migrate to the rural or semi-rural areas—all of which is productive of increasing sales possibilities for LP-Gas. He recommended that the operators should set up plans for leasing their residential equipment, rather than selling it outright, so that each might be in a position



E. L. MILLS



R. J. CANNIFF

to control his own customers. To assist manufacturers of equipment in making their own plans, he urged the dealers and distributors to place orders now for the materials they expect to need during the first three to six months of postwar activity.

Seward Abbott, of Servel, Inc., spoke more specifically on the postwar position of gas refrigeration. The problem of manufacturers being able to reconvert their plants back to peacetime output was posed as the big hurdle that has to be crossed, since dealers have few, if any, conversion problems of their own. The time lag between the placing of orders for basic stocks of steel and other raw material and the delivery of merchandise to the retailer will be the critical factor in our economy of the near future.

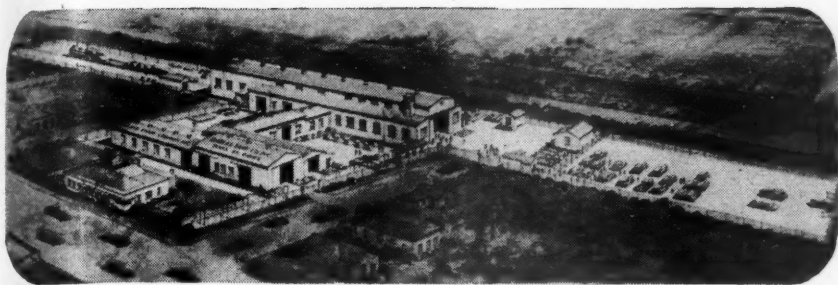
Urging gas refrigeration sales, particularly to the rural users, he said that during 1942 one-half of all the gas refrigerators sold in the southwest territory were sold to rural users. He urged the economy of higher gas sales through increased load per consumer as more desirable than more sales through the constant addition of more small consumers.

The publicity program of the LPGA

occupied the major portion of the Tuesday afternoon program, with Frier McCollister of Lawrence H. Selz Organization, Chicago, giving a report on the work that has been accomplished to date. Pointing out that LP-Gas needs a campaign of publicity in self-defense, if nothing else, he told of interviews with magazine editors, and editors of women's pages in rural publications. All are electricity minded, and gas has proven to many of them almost an unknown commodity as far as any glamour or reader appeal was concerned. Surveys made have also shown that women in rural areas are thinking in terms of electrical cooking to replace their present coal or wood equipment. In a survey made by "Progressive Farmer," for example, 36% of the respondents were planning to buy a range after the war, but only 3.5% were planning to cook with gas. In the refrigeration field, there were 20 times as many who expressed an intention of buying an electrical refrigerator as there were of those who were planning to keep food cold with gas.

Strongly supporting the plans of the publicity committee, Robert J. Canniff, of Servel Inc., Evansville, Ind., spoke on "Targets for Tomorrow," in the place of Carl Sorby, who was unable to be present at the meeting. As advertising, publicity, sales promotion and research director of his company, Mr. Canniff is well versed in the ways of publicity, and he endorsed the recommendations and the report of the committee which is now going to the members of the association with a proposal that membership dues be increased to defray the cost of a new campaign, and to replace the publicity assessment now in effect.

The competitive situation is des-



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A. N. KERR



F. McCOLLISTER

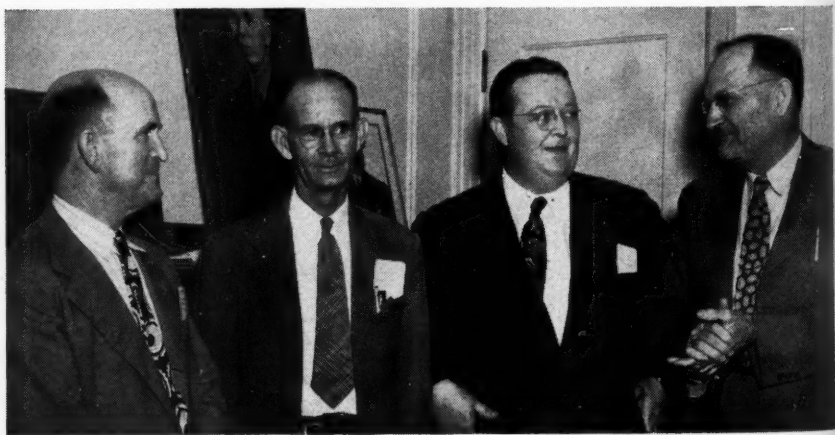
tinged to be more serious than many dealers realize, in the opinion of this speaker, who pointed out that electrical cookery advertising has gone on little diminished during the war years.

He concluded with a strong appeal for long range vision and national unity in the matter of industry publicity, and as indication of the sincerity of his own recommendations, proffered the trade paper advertising space of Servel to the LPGA publicity committee to assist it in placing

the publicity program before the entire industry. He also informed the meeting that a similar pledge of cooperation had been made by E. L. Mills for The Bastian-Blessing Co., and via telegram by E. Carl Sorby for the George D. Roper Corp.

Selwyn Turner, of the National Butane Co., Mobile, Ala., and vice-chairman of the Southern Section, LPGA, was in charge of arrangements for the meeting, and acted as chairman at both sessions. During the luncheon hours he was ably assisted by Dave D. Purrington, Standard Oil of Calif., San Francisco, and vice president of the LPGA, who acted as toastmaster.

Preceding the scheduled sessions there were held meetings of the Executive Board of the Liquefied Petroleum Gas Association, under the direction of President Louis Abramson, Jr., Petrolane Gas Corp., New Orleans; and of the Technical and Standards Committee, of which Walter H. Hoagland, Fisher Governor Co., Marshalltown, Iowa, is chairman.



J. D. Newcomb, Boiler Inspector Division, State of Arkansas; **H. O. Bailey**, butane inspector, State of Mississippi; **Gus J. Strauss**, director, Railroad Commission of Texas, and **M. U. Moss, Sr.**, director of Louisiana LP-Gas Commission.

Pacific Coast Section Members

Vote to Change Form of Organization

DESIRE for larger membership, funds for a salaried, full-time secretary, and an aggressive safety campaign directed toward local conditions, caused members of the Pacific Coast Section, LPGA, meeting in Fresno, Calif., Aug. 28, to vote unanimously for a new form of organization that will permit wider powers of self-government.



HARRY HORN

Specifically, it was decided to petition the national association for approval of a plan to form an independent Pacific Coast association with new by-laws and constitution, but to retain an affiliation with the national body. Provision for such procedure appears in the existing by-laws of the national Liquefied Petroleum Gas Association. Later, the resolution was presented to the LPGA Executive Board, but no final action has yet been taken upon the matter.

Harry Horn, Anaheim, Calif., took the initiative in recommending a new Western organization. He expressed belief that several hundred industry operators would join; that the increased membership would provide adequate funds to carry on needed work in safety education and industry publicity, with lower individual fees than present association members are taxed, and that the members would benefit greatly from the employment

of a full-time secretary who would direct the above-named objectives and perform other important obligations to members.

United action of the members in attendance at Fresno provided for the appointment by Chairman L. C. Roney of two committees, one to draw up a plan of organization, constitution and by-laws, headed by Harry Horn, and a second to canvass every dealer in the West for individual expression concerning membership in the new organization. The chairman of this committee is W. R. Sidenfaden, of the Home Gas Co., Ontario, Calif. Acting with Mr. Horn are:

Floyd Hampson, Western Gas & Power Co., Yakima, Wash.; W. T. Joplin, Butane Corp., Phoenix, Ariz.; Andy Anderson, Ransome Co., Emeryville; George Bragg, Bragg's Butane Supply Co., Fresno; Nat Belando, Garden City Butane Service, Santa Maria; J. R. Hunter, Carter-Hunter, El Centro; Don West, J. S. West & Co., Modesto; Frank Olmstead, Placer Gas Co., Auburn; Roy Tarleton, U. S. Heater Co., Compton, and Jos. Fagan, Mutual Liquid Gas Co., Inglewood, all of California.

Seattle Meeting of LPGA Is Indefinitely Postponed

Due to the extreme difficulties incident to travel on the Pacific Coast, the meeting of the Pacific Coast Section, LPGA, scheduled for Seattle on Oct. 2-3, has been cancelled.

No future date for the convention has been named.

Cooking Time and Temperature

LEST we appear like a couple of goons in the presence of royalty let us assimilate a few facts pertaining to commercial cooking before we venture into the presence of His Royal Highness, the Chef. The man with whom we are to talk is practical to the *nth* degree. He doesn't have much time for reading, and would probably discard such stuff as being impractical, if he did. What he has learned has been mostly in that excellent school of Practical Experience.

He doesn't go as much by thermometers and thermostats as we wish he did, although he uses them. He is reticent to divulge the secrets which he has learned for they are his stock in trade. You can know when you are right on a subject in his opinion by the silence which he maintains, but if you tell him something which he doesn't believe he will probably tell you so in pungent language. Don't try bluffing him unless you wish to lose his confidence. It is better in such instances to draw him out by asking questions.

As to confidence, this is something which you must earn from him, for high-pressure salesmen

By C. C. TURNER

Special Representative,
Butane-Propane News

have tried to load him up with equipment that he neither needs nor wants, and he is suspicious of the whole breed until he finds an individual whom he can trust.

Times are changing in the kitchen. War conditions are forcing it, and most chefs are not happy about it. It isn't only a matter of using substitutes and economizing on necessities. Besides rationing, points and reports, the same materials must go farther and all types of waste must be eliminated. Shrinkage of meats which once took up to 40% of the weight in cooking can be cut down by low temperature cooking methods, thereby making possible a greater number of servings from each pound purchased.

You must be acquainted with both the old and new schools of commercial cookery in order to meet him upon ground with which he is familiar and instill thoughts of economies and greater profits to be gained by this new way of doing things. You must also have

some idea of kitchen arrangement. By way of example, the chef doesn't want the dishwasher next to the range. Aside from the fact that it would be in his way, dish water might increase the quantity but not improve the quality of the soup!

Proved Facts Pertaining to Low Temperature Cooking Methods. For some time we have appreciated the value of low temperature cooking in the home, but we did not know much about this method in the commercial kitchen, and many doubted its practicability. It remained for the University of Texas to explore this field, which it did extensively in 1942 in its own eating establishments with startling results. The investigation was sponsored by the National Live Stock and Meat Board in the interest of procuring greater bulk from cooked meats. Here are a few of the things that were discovered in commercial kitchens.

1. A constant low oven temperature shrinks meat less than high temperature or searing methods.

2. Searing of meat does not keep the juices in.

3. A constant low oven temperature requires more time for cooking, but requires less fuel.

4. Less watching is required by low oven temperature methods.

5. Less spattering and burning of fats in the oven occurs with a constant, low oven temperature.

6. The drippings from low oven temperature cooking are more useable than those obtained from high temperature methods.

7. Meats are tastier and more ten-

der when cooked by the low oven temperature method.

Roasting. The low oven temperature method of roasting meats calls for oven temperatures of from 250° to 350°F. The degree of "doneness" depends upon the internal temperature attained rather than upon the length of time per pound, this varying with the shape of the meat cut, its tenderness, the number of roasts in a pan, the oven load, and other such factors. The internal temperature of the meat is determined by a meat thermometer which is inserted into the roast, the bulb reaching as near the center of the meat as possible. Some recommended temperatures for roasting by the low temperature method are given in Table 1.

If the chef is one of the old school that refuses to embrace this modern method, it might be handy for you to have some knowledge about high temperature roasting. Common practice by the old fashioned method was somewhat as shown in Table 2.

Study of Tables 1 and 2 leads to four conclusions:

1. That the high temperature method of cooking requires far more attention from the chef.

2. That high temperature methods will not give as uniform results.

3. That low temperature roasting is impossible with coal, wood, or oil as a fuel.

4. That the possibilities for error which occur in high temperature methods such as two settings of the thermostat, figuring of the necessary time, and watching a clock, are greater.

Broiling. The processes of broiling, griddle broiling, and frying are also dry heat methods of cooking, and it has been found that in these, as well as in roasting, low temperature methods are of advantage in eliminating waste by shrinkage. Whereas it was once thought that the griddle or fry pan had to be sizzling hot, and that meats had to be in close proximity to the broiler flame, the University of Texas investigation refutes these time honored customs. In broiling, the least shrinkage and loss in weight occurs when the top of the meat is three inches away from the gas burner, but the time required is considerably increased. The high temperature method requires from 10 to 20 minutes, depending upon the thickness of the steak or chop. Table 3 can serve as a guide for low temperature broiling of various cuts and kinds of meat.

Steaks broiled by the low temperature method are much juicier and more tender, but it is obvious that outside of those de luxe establishments which cater to the gourmand at premium prices the

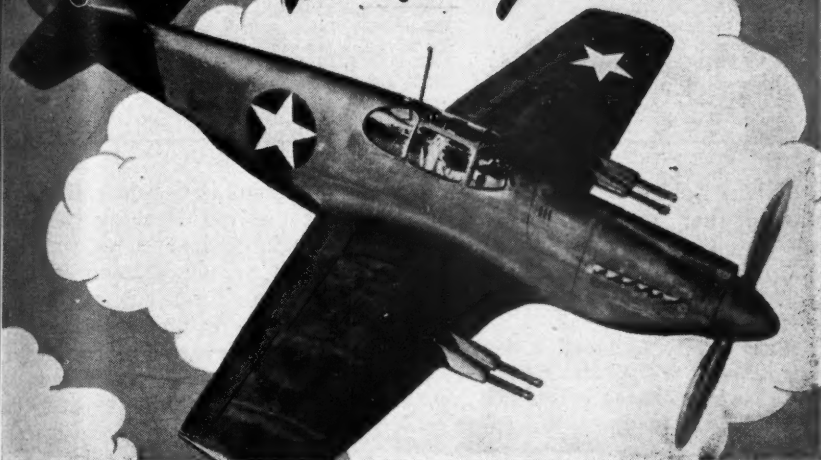
average restaurant cannot afford to spend the amount of time required for medium and well done broiling in this manner. For griddle broiling about one-half of the time given in Table 3 is required, but frequent turning is necessary, and shrinkage is apt to be greater. In those establishments catering to quick meals the high temperature method of broiling will remain in use, but the low temperature method may be adopted when a large number of orders are to be prepared at one time with plenty of advance notice as for a banquet.

Cooking of Bacon. In no place in the preparation of foods are losses as pronounced as in the cooking of bacon. The customary method of preparing it in a fry pan on top of the range results in a loss which may be as great as 78%. The percentage of fat in the bacon has much to do with this, but a change in cooking methods can effect marked economies. Table 4, containing data released by the National Live Stock and Meat Board, illustrates this.

Table 1. Oven and Internal Temperatures for Roasting by the Low Temperature Method

Kind of Meat	Hold Oven Temperature at	Until Internal Temperature of Meat is
Beef, rare	250	125
medium	250	140
well done	250	150
meat loaf	300	186
Pork, cured, such as ham.....	300	160
bacon, Canadian style	350	160
cottage roll	300	170
picnic	300	170
fresh	300 to 350	185
Veal	300	170
Lamb	300	180
Poultry	300 to 350	25 min. per lb.

Today's Fighters



Use Tomorrow's Oven Heat Controls

Today pilots of the swift and deadly P-51 Mustangs use a new kind of heat control — engineered, designed and manufactured by Robertshaw. Called an Actuator, this precision instrument controls engine operating temperature automatically. Robertshaw Actuators have nearly 500 parts, many built to tolerances ranging from .0001 to .0004 inches.

Tomorrow the skill and experience gained in the development of these Actuators will mean still better Robertshaw Oven Heat Controls. So tomorrow, more than ever, a Robertshaw Oven Heat Control will be a fuel and food saving plus which homemakers will be looking for on the ranges they buy.

Women's Interest Radio Programs Are Telling Homemakers About Robertshaw Oven Heat Controls

Robertshaw



ROBERTSHAW THERMOSTAT COMPANY • YOUNGWOOD, PENNSYLVANIA

OCTOBER — 1944

Table 2. Roasting Temperatures and Time for High Temperature Cooking

Kind of Meat	Starting Temperature	For Minutes	Temperature for Balance of Time	Number of Minutes for Each Pound of Roast
Beef, rare	500	15	350	20
medium	500	15	350	25
well done	500	15	350	20
Pork (all roasts)	500	15	350	30
Veal	500	15	350	25
Lamb	500	15	350	25

From Table 4 one can easily gather that the way to procure the greatest economy in cooking bacon is to:—

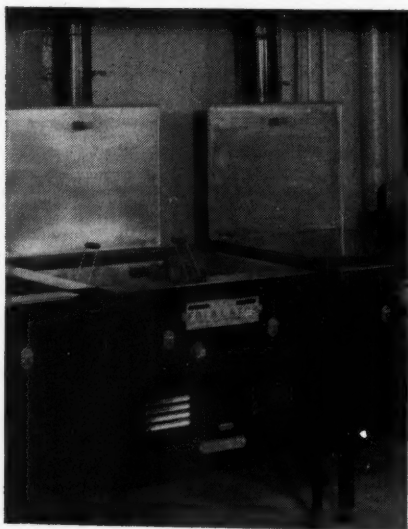
1. Cook it by the oven cooked drain method.

2. Fry it to as small a degree of crispness as will be desirable.

3. Purchase bacon with a maximum of lean meat in it.

Deep Fat Frying. Probably one of the least understood pieces of kitchen

equipment is the deep fat fryer for its use requires knowledge of fats, foods, temperatures, time, and technique of preparation in addition to an understanding of the mechanical operation of the fryer. Many good fryers are condemned not because of their inability to deliver the goods but because the operator does not know how to make them do it. A good fryer must have plenty of "wallop" in the way of instant application of immense quantities of heat. This is for the reason that slight differences in temperature make great differences in the results obtainable, and the sudden introduction of cold foodstuffs into hot fat rapidly reduces the temperature of the fat. Instantaneous thermostats are almost invariably found on deep fat fryers for this reason. A cold zone below the point of heat application is desirable in order that impurities may accumulate there and not contaminate all of the fat in the fryer. There should be a means of drawing off small quantities of fat from this low point so that such impurities may be removed at the close of each day's business. Some recommended temperatures and intervals of time as suggested



Deep-fat fryers in an Illinois town hotel.

COMMERCIAL, INDUSTRIAL APPLICATIONS

Table 3. Time Required for Low Temperature Broiling with Top Surface of Meat Approximately 3 Inches from the Gas Burner

Kind of Meat	Thickness of Meat in Inches	Number of Minutes Required for		
		Rare	Medium	Well Done
Porterhouse steak, fast frozen but thawed....	1	8	10	13
Porterhouse steak, fast frozen but not thawed..	1½	10	15	22
	2	20	30	42
Porterhouse steak, fast frozen but not thawed..	1	21	33	45
	1½	23	38	53
	2	33	43	55
Chuck	1	24	38	52
	1½	27-41	42-48	57-65
Rib	1	15	22	30
	1½	23	33	44
	2	31	65	85
Club	1	18	24	31
	1½	23	36	40
	2	36	48	60
Sirloin, pin bone	1	30	40	52
	1½	44	51	60
	2	57	65	75
Sirloin, round bone	1	16	21	29
	1½	29-34	42	52
	2	42	51	62
Sirloin, wedge bone.....	1	22	32	44
	1½	29	49	70
	2	36	70	100
Round	1	25	35	46
	1½	32	42	55
Patties	1	17	30	45
Shoulder lamb or mutton chops.....	1	12	15	18
	1½	17	20	24
	2	22	25	29
Rib lamb or mutton chops.....	1	..	12	..
	1½	..	17	..
	2	..	22	..
Loin lamb or mutton.....	1	12	15	19
	1½	17	20	24
	2	22	25	29

Table 4. Losses in Cooking Bacon

Factors Affecting Losses	Other Information	Average Percent of Total Loss
The Method of Cooking	Oven broiled	64.6
	Pan broiled (drained)	70.5
	Pan broiled (undrained)	70.1
	Oven cooked (drained)	52.6
	Oven cooked (undrained)	55.8
The Degree of "Doneness"	Fried, not crisp	63.7
	Fried, crisp	63.9
	Fried, overdone	71.0
The Amount of Fat	Lean, 40% fat, fried.....	65.3
	Medium fat, 50% fat, fried.....	75.6
	Fat, 60% fat, fried.....	78.7

Table 5. Time and Temperature Table for Deep Fat Frying

Food	Temperature of Fat	Time in Minutes
Potatoes		
Saratoga chips (potato chips)	325	5-8
French fried, blanching process	365-370	5-12
browning	395	2
Shoestring or Julienne	325-335	3-10
Latticed	350-375	3-10
Souffle, blanching process	225-240	5-8
puffing	425*	1
Fish		
Perch and simelts	370	3-5
Fillets	370	4-6
Fishcakes, croquettes, etc.	390	1
Oysters	390	1
Clams	380	1½
Chicken		
In batter	375	5-8
Croquettes	390	1
Meats		
Cutlets and breaded chops.....	360-400	5-8
Frankfurters	270	1
Pastry		
Doughnuts	385-390	3-5
Fritters	370-380	2-5
Chinese noodles	380	1
Nuts		
Almonds	240	4-6
Cashews	275	3-5
Peanuts, blanching	300	3-5
Spanish peanuts	350	3-5

* Temperatures above 400°F. are very destructive of fat and should be avoided if possible. If much frying at such high temperatures is encountered a special fat which is highly resistant to such levels of heat should be used.

by various authorities are given in Table 5.

It will be noted that in some instances considerable latitude of time is allowed. This is because some fats transfer heat more rapidly than others and also for the reason the patrons' tastes vary. Because of the wide variance in fat temperatures required for different foods, the installation of two or more fryers is often desirable.

The cost of fats is a variable and dependent in a measure upon the amount of absorption which occurs in cooking processes. A general idea of what this factor

may be can be gathered from a study of Table 6.

Table 6. Absorption of Cooking Fats by Percentages of Food Weight

Potatoes	
French fried	18%
Potato chips	40%
Doughnuts	20%
Croquettes	8%
Oysters and clams	18%

Commercial cooking fats for deep fat frying vary considerably in their characteristics, and you will find that each chef has his preference. In general, they have a light amber or yellow color when first melted, and should not at any

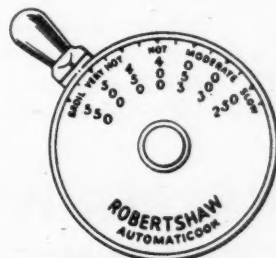
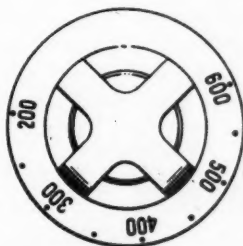
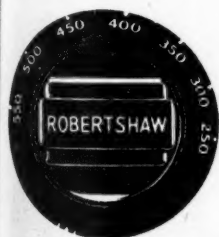
time be heated above 400°F. Overheating will cause them to break down, which in some instances means that they disintegrate into their component parts. A good fat will not smoke at temperatures below 400°F. although some vapor may be observed coming off from the top. This vapor should be vented in order to avoid "greasing up" of the kitchen and to eliminate a fire hazard. Poor fats will cause objectionable kitchen odors.

Care and Spoilage of Fats. The matter of temperatures above 400°F. as a cause of fat spoilage has already been mentioned. The presence of 1/100 of 1% scorched fat is enough to pollute that in an entire kettle. As stated above, foreign matter should be drained off from the bottom of the kettle at the close of each day's business. The practice of mixing new fat with old fat is to be discouraged excepting to replace that which has been lost due to absorption, evaporation, or drainage, and regular refilling dates should be

established, at which time the kettle should be thoroughly cleansed with good soap and hot water before a fresh supply of fat is put in the kettle. Harsh cleaning methods and the use of strong cleaning compounds should be avoided, as they may cause iron contamination of the fresh fat.

The new fat should be melted slowly and at low temperature in order to avoid scorching of the solid fat in contact with the heating surface. This also applies to starting the fryer for each day's operation when the fat in it has solidified. The use of copper utensils should be avoided because of the possibility of contamination of the fat due to uncombined acids in it acting upon the metal. Aluminum and iron utensils may be safely used.

Baking. The process of baking foodstuffs is accomplished in ovens at temperatures which are usually somewhat higher than those used for broiling, and the period of heat application is usually shorter in proportion to the weight of the



Heat control dials look like these. When you light your oven set dial for desired oven temperature. If baking, allow time for oven to reach this temperature. Meats can be started in cold oven. When oven reaches temperature of dial setting, fuel is automatically regulated to maintain the desired heat.

What will the gas range of

DISCUSSION NO.

Oven Burner Fittings will be Standardized

Too often before the war, ranges just "grewed up" like Topsy, little or no attention being paid to standardization. For example, oven and broiler burner fittings were produced in a wide variety of shapes and sizes—a range manufacturer often using a different one in every model in his line.

We predict that on the postwar gas range oven burner fittings will be standardized—standardized to the extent that one design will be used for an entire line of ranges. A universal fitting must provide maximum gas capacity . . . superior injection . . . lifetime service. It must be easy to assemble to tubing before being put in the range, thus permitting sub-assembly and testing for gas leakage. The sub-assembly must be easily fitted in any position in the range without removing the orifice cap. Such a fitting is available. The patented Wyman No. 36 Oven Burner Orifice Fitting was designed to meet these

requirements. Precision-machined from a brass forging, this fitting will give superior service for the life of the range. The orifice end of the fitting easily slips through a $\frac{3}{16}$ " diameter hole in a simple, inexpensive sheet metal bracket, and when the locknut is tightened against the bracket the orifice is held in perfect alignment with the venturi throat of the burner.

With only one design to stock, a range maker's inventory is reduced and further, being a standard item, the Wyman No. 36 Oven Fitting can be had promptly—thus eliminating the necessity of carrying a large variety or a large quantity of fittings in stock.

This time and money saving step of oven fitting standardization will undoubtedly be taken by the majority of range manufacturers on their postwar ranges. It will mean much to the gas industry.

HARPER-WYMAN COMPANY

8562 VINCENNES AVENUE
CHICAGO 20, ILLINOIS



2-burners-in-1

BUTANE-PROPANE New

food being cooked. There is a wide difference of opinion in regard to proper temperatures and time, but an average of observed conditions is to be found in Table 7.

The time and temperatures given in this table apply only to batch ovens, and not to those of the rotary or continuous type such as are found in large commercial bakeries devoted entirely to the production of bread and pastries, or in army cantonments. The recommendation and installation of such equipment should be made only under the di-

rection of an experienced factory man.

Sometimes a complaint will be made that a commercial bake oven does not bake properly at the temperature recommended and if the thermostat is set at a higher temperature the food products will be burned. Careful checking of such complaints usually proves that the oven is in calibration but that the trouble being experienced is due to falling temperature when the oven door is opened for introduction of the food to be baked. It is

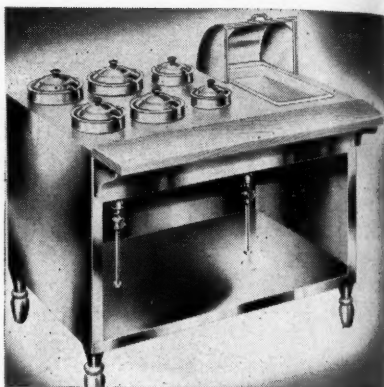
Table 7. Suggested Baking Temperatures and Time

<i>Food</i>	<i>Initial Temperature</i>	<i>Time</i>	<i>Finishing Temperature</i>	<i>Time</i>
Baked apples	400	Until tender		
Baked beans	300	6 hours		
Baking powder biscuits.....	450	12-15 min.		
Muffin mixtures	400	25 min.		
Pop-overs	450	30 min.	350	10 min.
Rolls	400	15-20 min.		
White bread	375	1 hour		
Dark or nut bread	350	1½ hours		
Angel cake	320	1 hour		
Individual or layer cake.....	375	25 min.		
Loaf cake	350	50 min.		
Sponge cake	325	1 hour.		
Dropped or rolled cookies.....	375	10 min.		
Thick cookies	350	12-15 min.		
Cream puffs	400	35 min.		
Fish, whole or stuffed	500	10 min.	450	10 min. per lb.
Gingerbread	350	35 min.		
Ham, sliced ¾-in.	375	1½ hours		
Meat loaf	400	45 min.		
Meringue	300	20 min.		
Pie, double crust, raw fruit....	425	40 min.		
Pie, double crust, cooked filling.	425	35-40 min.		
Deep dish pies	425	30 min.		
Open pies, one crust	450	40 min.		
Pie shells	450	15 min.		
Potatoes, white	450	45-60 min.		
Potatoes, sweet	450	35-45 min.		
Potatoes, scalloped	400	1 hour		
Bread or tapioca pudding	350	1 hour		
Rice or Indian pudding	300	3 hours		
Custard puddings	300	1 hour		
Souffles	325	45-50 min.		

COMMERCIAL, INDUSTRIAL APPLICATIONS

a well known fact that the opening of an oven door will cause a temperature drop of from 25° to 50°, for which reason it is recommended that the oven be pre-heated to 50° above the desired temperature and that the thermostat be reset to the desired temperature at the time that the foodstuffs are inserted in the oven.

Steam Tables. It is a physical impossibility for any eating establishment other than one of the boarding house type which serves its meals at definite and limited hours to cook and hold foodstuffs at a proper temperature for long periods of time without a modern, thermostatically controlled steam table. That matter of a proper holding temperature has been the subject of extensive investigation, and 180° F. has been found the proper one to maintain. If the temperature is much below this, the foodstuffs

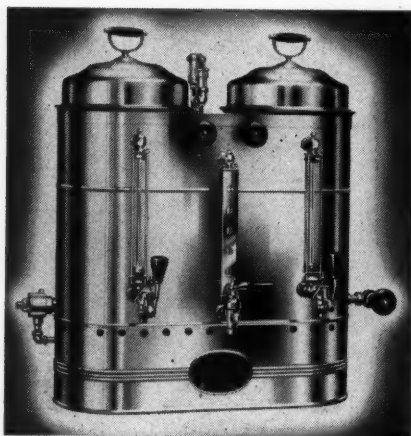


A heavy duty, stainless steel, gas steam table of semi-closed type, manufactured by S. Blickman, Inc.

are apt to crust, harden, or sour. Temperatures above 180° F. are apt to continue the cooking process.

No steam table installation should be attempted without thermostatic control, and the installation of several burners of small input beneath large steam tables is preferable to a single large burner in order that all of the food containers may be kept at an even temperature. The number of food containers required is dependent upon the variety upon the menu, and the size of the containers is governed by the amount of business done. Meat trays should be included in steam table assembly.

Coffee. A famous saying in reference to a 5-cent cigar might be paraphrased into "What this country needs is a good cup of coffee." Most restaurants serve passable coffee, but in many instances the flavor might be improved by proper brewing. The taste of coffee is influenced fully as much by brewing methods and proper proportioning



A combination type, twin coffee urn, commonly used in restaurants. Manufactured by S. Blickman, Inc.

as by the quality of the coffee used. The Massachusetts Institute of Technology spent \$30,000 in an investigation of coffee brewing methods, and here are a few of the things they discovered:

1. Coffee should never be boiled, for boiling increases its bitterness.
2. A holding temperature of 195°F. in the urns is best.
3. Metals in contact with hot coffee affect its taste.
4. Vitreous, or glass, urns or containers are best.
5. Water should be measured just as carefully as the coffee.
6. Water urns should have a capacity of about 2½ times that of the coffee urn.

As the matter of burner input is usually left up to the gas man, the suggestions in Table 8 may be of assistance.

Table 8. Burner Inputs for Coffee Urns

<i>If the capacity of the urn is</i>	<i>The burner should have an input of</i>
2 to 4 gals.	8,000 Btu.
5 to 8 gals.	12,000 Btu.
8 to 12 gals.	30,000 Btu.

No coffee or water urn installation should be attempted without the use of thermostats, and those of the throttling or gradual action type are usually installed in this type of service.

The Importance of Thermostats. While no more than passing mention has been made of thermostats in this chapter, the necessity of their use is obvious from the data given in the tables. Occasionally one may encounter a chef who prides himself on his ability

to judge temperatures and who is convinced that thermostats are unnecessary. You must handle such a man with diplomacy lest you offend him by what he might consider a slur upon his ability, but to put equipment in any commercial eating establishment without thermostatic control at every possible point means never-ending trouble for yourself and a dissatisfied customer. Your attitude for your own protection must be, "No Thermostats, No Gas!"

Amendment to L-86 Provides Methods to Obtain Tanks

The War Production Board announced Aug. 26 an amendment to Direction 1 of Order L-86, which outlines the procedure to be followed by consumers and dealers who seek to purchase LP-Gas tanks.

This action was taken to "spell out" the fact that preference, ratings granted on form WPB-541, or WPB-547 may not be deemed an authorization to purchase LP-Gas tanks.

Such authorization must be requested on form WPB-809, revised, or Form GA-855 and the original authorization, as well as a certified purchase order, must be presented to the tank manufacturer.

PART 2 OF "BURNER DESIGN" WILL APPEAR IN NOVEMBER

Last month there appeared in *Butane-Propane News* Part 1 of "LP-Gas Burner Design," by Dr. F. E. Vandaveer, of the AGA Testing Laboratories. It treated of burner ports, flame characteristics and mixing tubes.

Part 2 of this valuable article was scheduled to appear this month, but space limitations require its postponement until the November issue.—Editor.



The **HOMEMAKER'S FIRST CHOICE**

YES, it's a Gas Circulator of the **BRILLIANT FIRE** standard that will get the call this winter because fuel restrictions will necessitate getting highest efficiency and maximum heat production from every heating unit installed. The alert dealer realizes this, too, and is investing his certificates wisely **RIGHT NOW** to insure having adequate stock when the call comes. Aside from the fully enclosed vented model B-1 shown above, there are other Two and Three Way Circulators in the **BRILLIANT FIRE** line, ranging from 20,000 to 75,000 Btu capacity . . . Ready Now. Safety Pilots and Auto Valves available for immediate shipment.

Write for your copy of the new **BRILLIANT FIRE** Bulletin 460-E showing full line of WPB releases together with specifications and prices.

THE OHIO FOUNDRY & MFG. CO.
STUEBENVILLE, OHIO

"Quality Heating Equipment Since 1846"



Fire Prevention Week, Oct. 8-14

"HOLD an employee fire-extinguisher drill" is a suggestion to industrial and business managements for an employee activity during Fire Prevention Week, to be observed October 8-14.

The simplest way to hold a fire extinguisher drill is to have the employees attend a demonstration where the various types of extinguishers on the premises are operated and their use on the different classes of fire is explained.

Let Workers Use Extinguishers

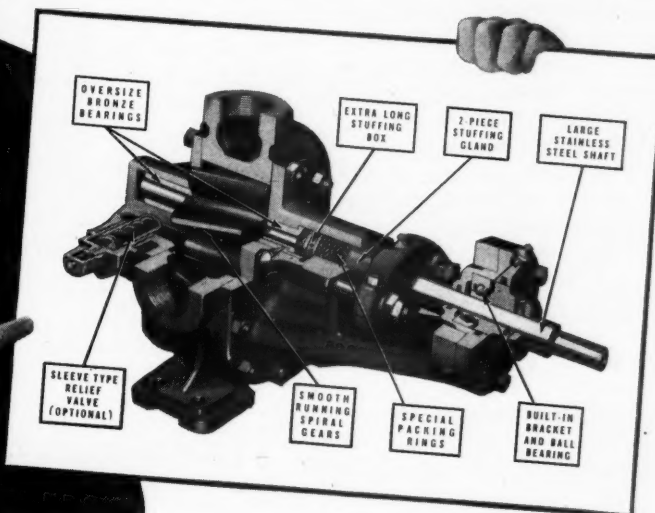
But it is better, when possible, to let the workers discharge the extinguishers themselves, under supervision, so that they will get the "feel" of the operation. The demonstrator can also supervise the recharging of an extinguisher of each type at this time, even though it is desirable that recharging and inspection of extinguishers be the responsibility of one or more men who have been specially trained in such work.

The use of actual test fires adds to the interest of a demonstration, but it is not essential and in many places is impracticable. If actual fires are to be set, permission, and if possible cooperation, should be obtained from the fire department.

Many firms hold frequent fire drills, when the workers are trained in all phases of small fire fighting and salvage work, and are repaid for this trouble by a marked reduction in their fire losses. But no business, however small, can afford to neglect holding at least one employee fire drill a year.

ROPER BUTANE PUMPS

last longer DUE TO
THESE CONSTRUCTION FEATURES



A Roper Butane Pump user from Oklahoma writes that he has pumped over 4,000,000 gallons during the last 33 months without one cent of expense for repairs. His comment is, "They would be hard to beat."

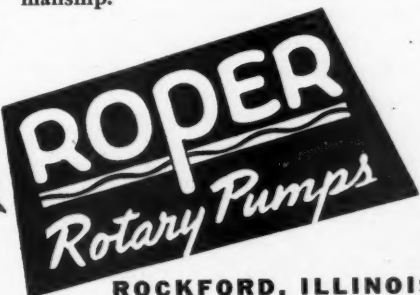
A Texas user, who recommends Ropers because of excellent performance, has pumped 1,800,000 gallons during the last 3 years with no repair expense whatever.

These are typical examples of Roper stamina, dependability and economy.

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GEO. D. ROPER CORP.



ROCKFORD, ILLINOIS

OCTOBER—1944

Electric Ranges Fail Three Times As Often as Gas, Says WPB

ELECTRIC ranges get out of order three times as fast as gas ranges, it has just been revealed in an official nationwide survey made by the Office of Civilian Requirements, WPB, according to the American Gas Association. The AGA release further says:

The study covers a wartime period during which replacement parts and service facilities for both types of ranges have become progressively scarcer. It is shown that 3% of electric ranges on the lines have gone out of commission while only 1% of the gas ranges have become unusable.

Although 20,305,080 gas ranges are shown to have been in use as compared with 3,542,944 electric ranges, only 203,051 gas models are reported as casualties as against 106,237 electric stoves.

The comparison becomes even more significant when a further study of the survey reveals that a relatively larger portion of the gas ranges covered in the analysis are more than five years old and on that basis might reasonably have been expected to give trouble more quickly than newer models of either type.

The government survey also shows that the gas industry made good progress in recent pre-war years in replacing older or obsolete models with modern gas ranges. Of the 20,305,080 gas ranges listed

in the compilation, 32.3% were shown to be five years old or less.

In addition to gas ranges, appliances registering only 1% casualties included gas and electric water heaters, with 9,492,416 of the former in use as against 1,203,264 of the latter. Gas heating stoves were also in the 1% class.

Amended L-23-c Relaxes Stove and Thermostat Order

Order L-23-c as amended Aug. 29, provides that any person who wants to manufacture or assemble more stoves than he has been authorized to make on Form GA-1850, or a person who has no authorization, may apply for permission under Priorities Regulation 25.

Application may also be made by persons wishing to manufacture or assemble accessories, or to produce thermostats for use with stoves.

Production of all stove items under Priorities Regulation 25 will be granted an AA-5 rating since they are on the Preferred Products List. The amended order deletes Schedule B, thus removing the former restriction on number of models, types and sizes permitted, and revokes Interpretation 2 which clarified Schedule B.

There is no restriction on fuel types any longer, but the exemption for military orders on manufacture of trailer or caboose stoves is removed. Broilers not using the oven burner are now included within the restrictions on accessories.

T-80

TRIMTHERM

GENERAL CONTROLS THERMOSTAT OF TOMORROW



SURFACE MOUNTING

With flush appearance; no recess in wall.

½° F. DIFFERENTIAL

Without false heat input.

UNOBTRUSIVE

Extends but 13/16" off the wall.

CORRECT DESIGN

Harmonizes with vertical walls.

PLASTIC BASE

Thermally isolates thermostat from wall.

VISIBLE MARKINGS

All calibrations easy to read.

KNOB ON COVER

No wall smear.

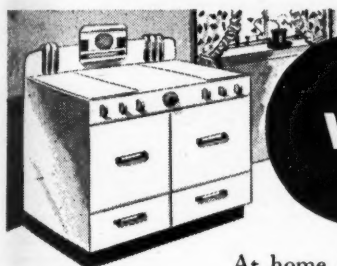
*Write for
Catalog 52*

GENERAL CONTROLS

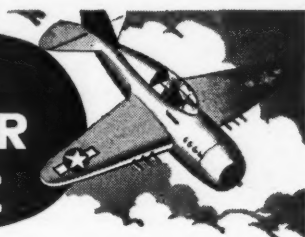
801 ALLEN AVENUE • GLENDALE 1, CALIF.

BRANCHES: Boston, New York, Philadelphia, Cleveland, Detroit, Denver, Chicago, Dallas and San Francisco

T-80 Series Thermostats for use with
all B-60 Series Gas Heating Controls



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WAR OR
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At home and on the industrial front, a dependable source of Butane and Propane means more satisfied customers. For more than fifty years, through wars and in peace times, Carter has faithfully served. Write us for higher quality Butane and Propane.

DEHYDRATED

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WHOLESALE ONLY *Oil Company*
TULSA, OKLAHOMA

OCTOBER—1944

73

Water Heaters Production May Be Increased Now

Order L-185 as amended Aug. 29th, provides for additional production of water heaters upon application under Priorities Regulation 25.

The amendment also eliminates previous restrictions upon sources of material used in the manufacture of metal jackets.

New Texas Dealers Plan for Large Postwar Business

The "L. P. G. Equipment Co." has recently been organized in Sealy, Texas, to conduct a wholesale and retail LP-Gas business. The territory the firm expects to cover extends over eight Southern states from Texas to Florida.

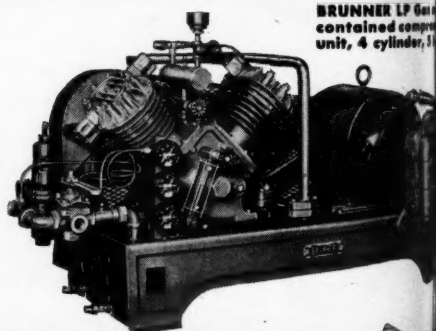
E. S. Beggs, who formerly traveled the Texas country for the Century Gas Equipment Co., will head up the organization, handling sales. M. L. Hager will have charge of service and installation. The company is a limited partnership.

A full line of domestic appliances will be carried in stock for retail trade, while Smith Precision pumps, Century carburetors, tank valve and fittings and other equipment will be jobbed to dealers. The firm has two 1000-gal. delivery trucks for local deliveries. Office and warehouse will be at Sealy.

According to Mr. Beggs, the company plans to specialize in conversion equipment for changing over stationary and mobile engines in rice driers and rice field tractors in East Texas and to conduct a general engine conversion business.

DON'T LOSE VITAL LP GAS VAPORS when unloading tank cars

Many LP Gas operators are losing 500 to 1000 lbs. of liquid petroleum gas because they don't salvage the vapor left in tank cars after unloading. But they are paying for this lost poundage and its transportation! You can salvage this residue vapor by using the Brunner LP Gas Unit. This saving alone will quickly pay for the unit. In addition, the Brunner unit will reduce the time for tank car unloading. The Brunner LP Gas Unit for gas transfer and recovery is outstanding in speed, efficiency, safety and low costs. Brunner Manufacturing Co., Utica, N. Y., U. S. A.



BRUNNER LP Gas Unit
contained compressed
unit, 4 cylinder, 10

WRITE FOR THIS NEW FREE BOOKLET

It describes the Brunner LP Gas Unit and contains more illustrations, diagrams, tables and valuable information on the handling of LP Gas than any booklet ever issued.



For over 36 years the Symbol of Quality



CURRENT READING

● Reviews of new books, pamphlets and articles published in recent magazines of interest to technicians and executives in the liquefied petroleum gas industry. Those interested in reading any complete article or book should write to the publications named.

Permeation of Hydrocarbon Gases Through Rubber Tubing—M. J. Stross, J. L. Riley and H. M. Eby. "Journal of the Institute of Petroleum," June, 1944, pp. 153-166. Gas permeability for planar films of rubber varies inversely with the thickness of the film and directly with the area. Likewise permeation of gases through rubber tubing varies directly with the inside diameter and inversely with the wall thickness. For each type of rubber tubing the rate of permeation of different gases varies over a wide range. In general, monoolefins permeate rubber more rapidly than paraffins. The hydrocarbons of the C₄ group permeate rubber tubing much more rapidly than those of lower molecular weight, and the normal hydrocarbons more rapidly than branched isomers. Synthetic rubber tubing—eg., Neoprene and particularly Koroseal—are much less permeable than compounds of natural rubber. Plastic tubings such as Resistoflex are much superior in this respect to either synthetic or natural rubber, but are limited in application because of their solubility.

Method for Calculating Heat Losses Through Refractory Walls—"National Petroleum News," July 5, 1944, pp. R-434, 436, 437. A suggested procedure for calculating losses in heat

in its transmission through walls of refractory materials is included in the latest manual of Standards on Refractory Materials of the American Society for Testing Materials. In petroleum refineries such a method would find application in the use of refractory walls for boiler furnaces and furnaces for processing units, also in the more recent use of refractory linings for reactor vessels and large size piping in processes where solid catalysts are used, where the refractory material is applied for abrasion resistance to the catalyst at high operating temperatures.

Economic Design of Pressure Vessels—E. F. Bruumerstedt. "National Petroleum News," July 5, 1944, pp. R-447. Article 3—Materials and Construction Factors. In this third article in a series dealing with analytical methods for determining economic design of pressure vessels, the part which materials and construction factors play in design is discussed. Different operating conditions are assumed for a given size tank and it is pointed out how various grades of steel affect construction costs.

Vapor Lock—Or Dumb Engineering—R. J. S. Pigott. "S.A.E. Journal," July, 1944, pp. 310-317. A quick survey of the hydraulic aspects of the vapor-lock problem is given in this article. The hydraulic design of the supply system from the tank to the fuel pump is discussed by the author. The cause for carburetor vapor lock beyond the fuel pump becomes very largely a question of the ability of control orifices of any type

to measure mixtures. In general, control orifices can only measure a homogeneous fluid correctly. The general methods of calculating a system for obtaining the limiting tank temperature for take-off and the limiting altitude for any system, are discussed, and the requirements summarized.

Postwar Motor Gasolines—A. H. Adams and B. H. Weil. "Chemical and Engineering News," July 25, 1944, pp. 1154-1161. Consensus among automotive and petroleum experts indicates that some 20,000,000 of the nation's prewar nearly 30,000,000 cars will remain in operating condition at the war's end, maintaining, with the help of some military consumption and increased commercial and farm use, a volumetric market for gasoline of at least 75% of the prewar level. A rapid recovery to or above normal prewar use is expected to follow as new tires and cars come into production. The immediate postwar cars will probably be the 1942 models, with changes in automobile design expected to come slowly. One hundred octane automotive fuels are not expected to be required for some years, if ever.

Regular, Thorough Inspections Keep Atlantic Refining Company's Trucks Rolling—H. Taylor. "National Petroleum News," July 26, 1944, pp. 14, etc. Out of 1000 vehicles, company has had only 3 laid up for lack of parts since Pearl Harbor; lubrication is keystone. The company's maintenance program is described.

Alignment Chart for Orifice Meter Calculation for Gas Pipe Line—"Oil and Gas Journal," July 22, 1944, pp. 70, 71. The chart is illustrated and its use described.

Economic Factors of the Corrosion Problem—H. C. Gear. "Petroleum Engineer," July, 1944, pp. 128, etc. A study of the depreciation of pipe line systems due to corrosion.

Prediction of Conditions for Hydrate Formation in Natural Gases—D. L. Katz. "Petroleum Technology," July, 1944. 10 pp. Charts for predicting the pressure to which natural gases may be expanded without hydrate formation have been prepared for gases of even gravity. Pressure-temperature curves for hydrate formation were established for gases having gravities from 0.6 to 1.0. These curves and the thermal behavior of the gases during free and adiabatic expansion were used to prepare the charts for estimating the permissible expansion of natural gases without hydrate formation.

The Calculation of the Volumes Contained in the Partially Filled Dish Ends of Horizontal Cylindrical Tanks—H. A. Blackmore. "Journal of the Institute of Petroleum," June, 1944, pp. 167-170.

List of Inspected Electrical Equipment, May, 1944. Published by the Underwriters' Laboratories, Inc.

Apparatus for Determining Minimum Energies for Electric-Spark Ignition of Flammable Gases and Vapors—F. C. Guest. Bureau of Mines, R.I. 3753.

National Motor-Gasoline Survey, Winter, 1943-44, by O. C. Blade. Bureau of Mines, R.I. 3758.

The Design of Ring Girders for Horizontal Tanks—A. C. Barton. "Petroleum Refiner," June, 1944, pp. 95-105.

Transport Tanks for Every Need



Transport tanks of all types built to specifications. LP Gas tanks—cylindrical or spherical—can be built in our complete shops to suit your individual needs. Our engineers will give you the answer to your problems.

SUPERIOR TANK & CONSTRUCTION CO.

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Los Angeles, California
Night: Fairfax 1545



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STREET

CITY

ZONE

STATE

OCTOBER—1944

77

PRESSURE TIGHTNESS



Gases and Liquids Can't Escape from REX-FLEX Stainless Steel Flexible Metal Tubing

PRESSURE tightness is another characteristic of REX-FLEX Stainless Steel Flexible Metal Tubing. There is no seepage of gases and liquids at high or low temperatures within rated pressure capacity. Fittings and flanges are circular seam-welded to provide leakproof, uni-metal assemblies having the strength and compactness essential for many applications.

REX-FLEX is lightweight and extremely flexible. It has the corrosion-resisting features of 18-8 Austenitic stainless steel—and "18-8" temperature characteristics, as well. REX-FLEX—available in sizes from 1 to 6 inches I.D. inclusive—was originally developed for the aircraft industry. It has since proved its value for many general industrial requirements.

Chicago Metal Hose Corporation engineers will gladly help you adapt REX-FLEX to your needs. Write for complete information today.

Flexible Metal Hose for Every Industrial Use

CHICAGO METAL HOSE CORPORATION
MAYWOOD, ILLINOIS

Plants: Maywood and Elgin, Ill.



THE TRADE

Ralph E. Kruck, industrial designer of Springfield, Mass., has been retained by Florence Stove Co., Gardner, Mass., according to a recent announcement by R. L. Fowler, president.

In making the announcement, Mr. Fowler said, "Eye appeal has always been a strong feature of Florence ranges and heaters, and we intend to make it an all-important consideration in our postwar lines. Mr. Kruck's appointment is one step in our extensive plans for postwar expansion. We have a large, modern merchandise development department in charge of Frank H. Schneider, and Mr. Kruck is working closely with him in designing all types of Florence ranges and heaters."



R. E. KRUCK

Rheem Manufacturing Co. has acquired the business of Stokermatic Co., of Salt Lake City. This acquisition will permit Rheem to manufacture and distribute Stokermatic products on a world-wide basis.

In addition to its peacetime products which include water heaters, floor furnaces, boilers and tanks, Rheem also is a large manufacturer of steel shipping containers.

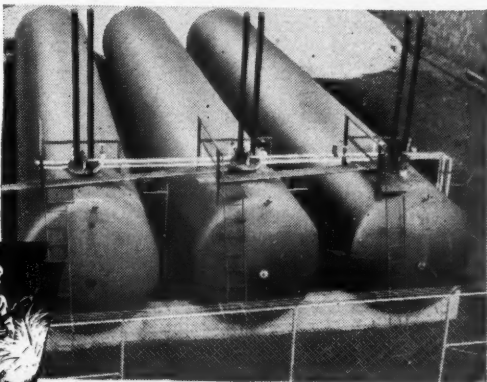
In its plants located at Richmond, Los Angeles, and Stockton, Calif.;

DE NOW IS THE TIME . . . TO GET READY

The expansion of the propane gas industry has been retarded for the past few years, due to materials essential for its development being unavailable on account of material necessity in the war effort.

The war is definitely NOT over. However, in line with good business principles, now is a good time to lay plans for post-war industrial amplification.

Naturally, when considering the purchase of propane storage tanks either for underground or surface use, the name



DOWNTOWN IRON WORKS
DOWNTOWN, PA.
WELDED and RIVETED PRODUCTS

DOWNTOWN readily comes to mind. Our long and successful experience in design, selection of materials and fabrication of this type of construction, places us in a position to render complete service.

Consult our Engineers—now . . . for preliminary plans and specifications.

We Welcome Inquiries . . . No Obligation Incurred.

Note to Buyers Looking for Good Heating

You can buy Reznor Unit Heaters without certificates of any kind. The only restriction is on the use of gas, and the rulings differ for different sections. Check with your gas company.

REZNOR HAS A HEATER FOR ANY SIZE SPACE

Reznor Unit Heaters are available in nine sizes. Your choice will depend upon the size of area to be heated. Automatic Reznor Unit Heaters serve either as auxiliary or primary heat in such installations as factories, offices, stores, garages, homes, churches, bowling alleys, restaurants, and many, many other places.

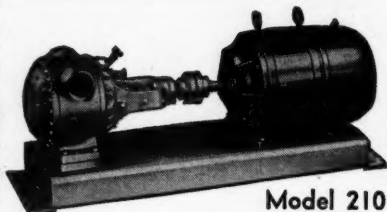


The sooner you place your orders, the quicker you will get your heaters. Materials are coming through in limited quantities, and your deliveries will be made just as soon as possible.

REZNOR MANUFACTURING CO. **REZNOR** 304 JAMES ST., MERCER, PA.

"GAS HEATERS EXCLUSIVELY SINCE 1888"

SMITH BUTANE-PROPANE PUMPS



Model 210

STANDARD EQUIPMENT

With Leading LPG Engineers

MODEL 210 (Above) • 2" pipe size. Capacity 50 GPM at 1750 RPM for direct connecting to electric motor.

MODEL 211 • 2" pipe size. Capacity 50 GPM at 500 RPM for tank truck direct connected to power take-off.

MODEL 300 • 3" pipe size. Capacity 100 GPM at 1750 RPM for direct connecting to electric motor.

MODEL 301 • 3" pipe size. Capacity 100 GPM at 500 RPM for large transport service direct connected to power take-off drive.

**BALANCED GEAR CONSTRUCTION
RELIEVES BEARING LOADS**

**FLUID SEALED PACKING BOX
ELIMINATES HAZARDOUS LEAKS**

250 LBS. WORKING PRESSURE

Complete Assemblies

Including Motors

Write for literature and prices.

SMITH Precision Products COMPANY
135 MISSION ST. - SOUTH PASADENA, CALIF.

Portland, Ore.; Houston, Tex.; New Orleans, La.; Birmingham, Ala.; Chicago, Ill.; Sparrows Point, Md.; Danville, Pa.; and Bayonne, N. J., Rheem is at present manufacturing a wide variety of war materials.

The Rheem company maintains executive and general sales offices in San Francisco, Los Angeles, New York and Washington, D. C.

Ralph F. Merriam has been named to the post of purchasing agent for the Cleveland Co-operative Stove Co. and its divisions, Grand Home Appliance Co., and Cleveland Foundry Co., according to an announcement made by the firm's president, James Mitchell. Mr. Merriam succeeds Victor H. Gordon, now serving in the U. S. Army.



R. F. MERRIAM

The purchasing department is located at 2323 East 67th St., Cleveland, Ohio.

The Tennessee Enamel Manufacturing Co., Nashville, has received word from Under Secretary of War Robert P. Patterson, that it has been awarded the Army-Navy Production Award for high achievement in the production of war material, according to Miss Jean Hall of the company's advertising department.

This second renewal adds a second white star to the firm's award flag.

Reznor Manufacturing Co., Mercer, Pa., has just prepared three data sheets which show roughed-in drawings, dimensions, and input and output ratings for all three types of its

*"Never mind little bride, some day
you'll have a range that really cooks"*



*...and it's going to be
a brand new Magic Chef"*

THE DAY IS COMING—and let's hope it will be soon—
when you and your husband can settle down in a "Happiness
Home" of your very own!

Then you can stop worrying over the uncertain performance of
that old-fashioned stove. Because, of course, he's going to insist on
getting you a range that really cooks—a sparkingly new Magic
Chef. It will be beautiful as well as convenient and practical. And
so easy to use, with gas, the ideal fuel!

Until our war job is done, we can't build your new Magic
Chef for you. But it will be ready just as soon as possible after
victory. And it will be worth waiting for!

Do you live beyond the gas mains?
If so, we assure you that fine, new
Magic Chef ranges will be available
after the war for "Pyroflex" Gas in
western and central states and for
other L. P. (bottled and tank) gases
elsewhere.

One of American Stove Company's
plants is building a gas range in the
model permitted by U. S. P. B. If your
immediate need for a range is urgent,
ask your dealer or gas company how
you can get one.

Ⓜ This "CP" seal on your post-
war Magic Chef will assure
you of "Certified Performance" in
your cooking. Look for it.

AMERICAN STOVE COMPANY
Cleveland, Ohio



You can plan on owning a Magic
Chef like this after the war



Magic Chef

THE RED WHEEL GAS RANGE WITH THE LIFETIME BURNER GUARANTEE
Copyright 1944 American Stove Co.

THE SATURDAY EVENING POST · GOOD HOUSEKEEPING
WOMAN'S HOME COMPANION · ARCHITECTURAL FORUM
PARENT'S MAGAZINE · BETTER HOMES & GARDENS

45,265,474 READERS

Magic Chef NATIONAL ADVERTISING

is doing these things

1 Maintaining outstanding public
preference for Magic Chef Gas Ranges.

2 Presenting the Magic Chef story to
your best postwar prospects against a
background of timely, human interest
situations in present day American
homes.

3 Informing your prospects that
Magic Chef gas ranges will be avail-
able for regular city gas service and
L. P. bottled or tank gases.

4 Creating the desire in your pros-
pects to have a Magic Chef Gas Range.

The advertisement shown at the left
appears in the October 14th issue of
THE SATURDAY EVENING POST and
in other leading national magazines.

For franchise information on Magic
Chef Gas Ranges, write your nearest
American Stove Company office.

AMERICAN STOVE COMPANY

4901 Perkins Avenue • Cleveland, Ohio

New York • Philadelphia • Cleveland
Chicago • St. Louis • Atlanta • Los Angeles



Magic Chef

RED WHEEL GAS RANGES
AND HEAVY DUTY GAS COOKING EQUIPMENT



Awarded to
Quick Meal Stove Co.
Division of American
Stove Co.

SMITH METER BU-40
for Butane



**Built for Its Job —
NOT an adaptation!**

• Smith Meter BU-40 is built for the job of metering Butane. This is not an adaptation of some other meter. *Sustained accuracy* is guaranteed. The Smith positive displacement Rotary Principle insures fast, steady flow and low head loss. Capacity: 50 g.p.m.; working pressure—up to 250 lbs. p.s.i.

Available for corrosive or non-corrosive service on priority.

SMITH METER COMPANY

SUBSIDIARY OF A. O. SMITH CORPORATION
Factories at Los Angeles and Milwaukee

SALES OFFICES AT NEW YORK • CHICAGO • HOUSTON • LOS ANGELES

gas-fired unit heaters, propeller fan type, blower type, and duct type.

These pages are simplified, having all the dimensions and ratings for each type of heater on individual pages. Reznor Manufacturing Co. will gladly furnish these pages to anyone who requests them.



The new "staggered" top Roper gas range, containing large baking oven, "roll" broiler and 4 top burners.

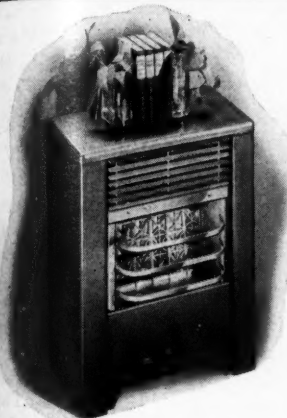
Edward R. Martin has been appointed chief marketing statistician for Servel Inc., Evansville, Ind., it was announced recently by Lyman Hill, sales research director.

Before going to Servel, Mr. Martin was associated with the American Gas Association in New York for nine years as superintendent of statistical activities.

Fisher Governor Co., Marshalltown, Iowa, was recently awarded the second star to their Army-Navy "E" Flag which signifies continued excellence in the production of war materials.

Fisher Governor Co. is still 100%

BUTANE-PROPANE News



DEARBORN

WORLD'S FINEST...SAFEST
L.P.G. GAS HEATERS

A complete line of Vented and Unvented Quality heaters. Their Ultra Smart Appearance, Outstanding L.P.G. Performance and many Exclusive Features create unprecedented user enthusiasm. You are assured satisfied customers and decidedly lower service costs when you sell this fine line.



BUT. NAT.
PRO. MFG.
MIX. GAS.

FAMOUS HI-CROWN BURNER

BLUE FLAME PILOT LIGHT

Leading L.P.G. Distributors from coast to coast rate it the finest of all burners for Butane. It "performs" without coaxing, constant cleaning or adjusting. Its quiet, odorless operation, great flexibility and reserve capacity insures your customers being completely satisfied.

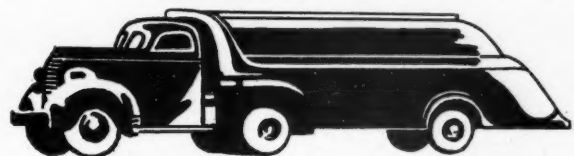
DEARBORN STOVE CO.

3256 Milwaukee Ave.,
CHICAGO, ILL

3625 S. Grand Ave.
LOS ANGELES, CALIF.

FEATURES THAT SELL

A.G.A. Approval, Hi-Crown Burners, Automatic Lighting, Syphonaire Chassis, and Air Insulated Cabinets are features your customers want. Finer—Safer, heaters, yet priced unbelievably LOW. Write for literature.



TRANSPORT TANKS

Butane-Propane Transport Tanks made to specifications. Also Butane Domestic and Industrial Systems, Storage Tanks and other Fabrications. Wire, write or phone your inquiries to

TEXAS

Boiler & Machinery Co.

3215 HICKORY ST., DALLAS, TEXAS

Harwood 7111

*—when the time comes
look to*

BUEHLER

Manufacturers of tanks,
tank heads,
pressed steel
products

BUEHLER

Tank and Welding Works

5000 Pacific Blvd.
Los Angeles 11, Calif.



L.C. RONEY, INC.

meets the demands of the nation. Our plant has gone to war for the duration—but when peace comes, L. C. RONEY products for the LP-Gas industry will meet the demands of dealers everywhere. In the meantime—our stock of LP-Gas equipment is still complete.

L.C. RONEY INC.
140 44th ST - LOS ANGELES, CALIF.

on war work. This firm was originally awarded the Army-Navy "E" Flag on July 14, 1943; the first star was awarded in February of this year, and this, the second, star on Sept. 9.

The New York factory branch of General Controls, Glendale, Calif., manufacturers of automatic pressure, temperature and flow controls, has occupied new and larger quarters in the Architects Bldg., 101 Park Ave., New York City. According to Branch Manager John Hammond, the move was made to meet increasing demands for General Controls'



JOHN HAMMOND

products, and to provide better service to customers.

"In our sales and service offices on the sixth floor," states Mr. Hammond, "we have complete facilities for doing a real sales engineering and counseling job for our users. There are practical working displays showing the many uses of our controls in various industries. Customers' needs can be filled quickly from a large, amply-filled stockroom. On the ground floor we have a 7-ft. high display with 'General Controls' in lucite letters that can be seen from Park Avenue."

In line with General Controls' expansion program, the Cleveland branch also moved into new quarters recently at 3224 Euclid Ave.

Tappan Stove Co.'s vice president, W. Hubert Tappan, referring to post-war merchandising, recently said:

"A public that has been deprived of

BUTANE-PROPANE News



BUTANE-PROPANE EQUIPMENT

PUMPS
METERS
HOSE
VALVES
REGULATORS
FITTINGS

Roadmaster Sales Corp.

of Texas
317 So. Pearl Street Dallas, Texas

STOPS *all* LEAKS

Yes, TITE SEAL gasket and joint-sealing compound stops ALL leakage of LP gases and liquids because TITE SEAL is heat proof, cold proof, pressure tite, vibration proof and non-solvent.

TiteSeal always remains plastic and always permits easy disassembly.

ALWAYS SPECIFY

TiteSeal

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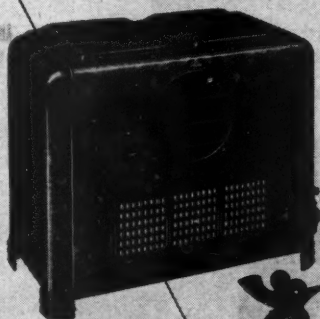
RADIATOR SPECIALTY COMPANY

CHARLOTTE 1, NORTH CAROLINA

BRANCHES: LOS ANGELES, CALIFORNIA • TORONTO 2, CANADA

Bu-Pro-Fire
Gas Heaters

A GOOD NAME TO REMEMBER FOR GREATER HEATING EFFICIENCY WITH LIQUEFIED PETROLEUM GASES.



DESIGNED ESPECIALLY
FOR L. P. GASES

TENNESSEE ENAMEL MFG. CO.
NASHVILLE 9, TENNESSEE

OCTOBER—1944

SPACE HEATERS

Prepare for
Peace with
PEERLESS



Nationally Accepted!

NOW building several models, including Enclosed Radiant Type, Unvented Circulator (6190A) pictured above. Two sizes . . . 5 double radiant, 20,000 Btu . . . 7 double radiant, 28,000 Btu. Part of a complete LP-Gas line, from bathroom heaters to floor furnaces, we will offer when war restrictions are lifted.

PEERLESS

MANUFACTURING CORP.
LOUISVILLE 10, KENTUCKY

BRODIE METERS

SAVE

- ★ ERRORS
- ★ LOSSES
- ★ DELAYS
- ★ EQUIPMENT



RALPH N. BRODIE CO., INC.

953 - 61st Street, Oakland (8) California • Cable Address "BRODICO" • Division Offices. Chrysler Bldg., New York City
59 E. Van Buren, Chicago • 302 South Pearl St., Dallas, Texas
Representatives and Stocks in All Principal Cities

new stoves and other household appliances is going to be so hungry for new products after the war that in order to meet the consumer's needs manufacturers will turn out products similar in design to those bought before the war."

Mr. Tappan believes that manufacturers will make domestic goods under a program covering three definite stages, as follows:

"First, immediately after the war there will be restricted production of articles of pre-war design because materials will be scarce and plants won't have a chance to change their equipment.

"The second period, coming several months later, will see manufacturers turning out a complete line of products of conventional design but incorporating certain new developments and improvements.

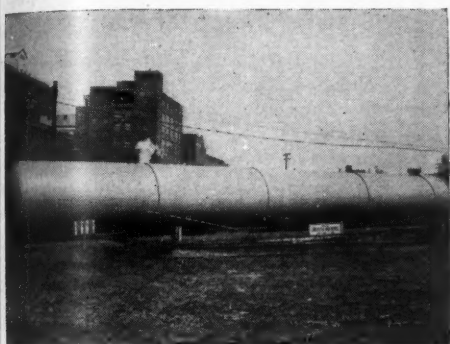
"Finally the third stage, which will take place very much later than the second, will be an era of fantastic models when we will be buying streamlined cars, kitchen appliances, and home furnishings that are only dreamed of now."

Partnership Formed for LP-Gas Dealership in Redlands, Calif.

To be ready for postwar activities, the "Rural Gas & Appliance Co." is now being established in Redlands, Calif., by H. E. Owens and R. C. Harris. Operations will start about Oct. 15.

The American Pipe and Steel Corp., Alhambra, Calif., has a contract for the construction and installation of a bulk storage plant of 6500 gal. capacity.

A general domestic business will be undertaken, and a full line of appliances and equipment will be carried as these become available.



30,000 Gallon Water—25,000 Gallon Liquid Propane Capacity Storage Tank 8'4-13/16" O.D. x 76'9-5/16" Long

Complete bulk plants designed, fabricated and installed by experienced men. Detailed information and estimates furnished without obligation.

GAS PLANTS FOR MUNICIPALITIES

LEADERSHIP!

Quality - Safety
Economy

Butane-Propane tanks fabricated in strict accordance with the ASME code; API-ASME Code; Dept. of Public Safety, Commonwealth of Massachusetts; and National Board of Boiler & Pressure Vessel Inspectors' regulations.

Bulk Tanks - Skid Tanks
Truck Tanks

for

Butane • Propane
Butane-Propane Mixtures

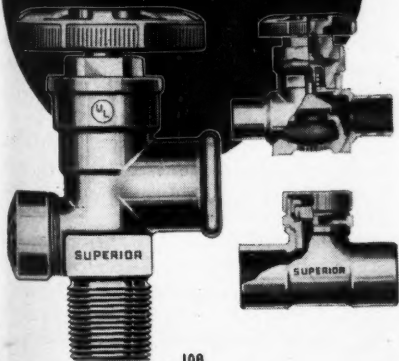
**LANCASTER IRON
WORKS, INC.**

LANCASTER

PENNA.

Superior LP-GAS VALVES AND ACCESSORIES

For Bulk Stations, Tank Trucks, and above and below ground systems.

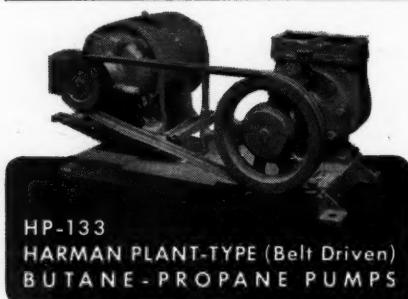


108

- ★ LP-GAS CYLINDER VALVES are listed as Standard and for re-examination service by Underwriters' Laboratories, Inc.
- ★ GLOBE, LINE AND ANGLE VALVES — Diaphragm Packless and Wing Cap — in Flare sizes from 1/4" to 3/8" O.D.; Sweat sizes from 1/4" to 2 1/2" O.D.; F.P.T. sizes from 1/2" to 2".
- ★ SIGHT GLASSES, suitable for any normal LP-Gas pressure. Entire top assembly removable while soldering lines to body.
- ★ FLARE FITTINGS, including Unions, Couplings, Adapters, Elbows, Tees and Nuts — listed as Standard by Underwriters' Laboratories, Inc.

**SUPERIOR
VALVE & FITTINGS COMPANY**
PITTSBURGH 26, PENNSYLVANIA

For
PROPANE or
BUTANE
 •
Supplied or
transported
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Write
CITIES FUEL
EXCHANGE
 P.O. BOX 365
 FRESNO 8, CALIFORNIA



HP-133
HARMAN PLANT-TYPE (Belt Driven)
BUTANE-PROPANE PUMPS

POSITIVE DISPLACEMENT • REVERSIBLE ROTATION
LOW FRICTION BEARINGS • NO CONTACTING METAL PARTS

Especially designed for transferring LPG between storage tanks, tank cars and automotive fuel tanks at Bulk Plants and Service Stations. Harman Rotary Pump with V-belt drive, mounted on bed plate. Adjustable motor base permits quick adjustment of V-belt tension and changing of belts. Harman Principle—single rotor on shaft rotating off center—assures high operating efficiency. Capacities, 10 to 100 G.P.M.

Write Today for Complete Information and Prices!

HARMAN EQUIPMENT COMPANY

Distributors

937 Santa Fe Avenue, Los Angeles 21 • 7 Front Street, San Francisco 31
 PETROLEUM PRODUCTS HANDLING AND DISPENSING EQUIPMENT

New Order Gives LP-Gas Men Construction Materials

The Petroleum Administration for War, on Aug. 26, called attention to the fact that distributors and marketers of liquefied petroleum gas now may use materials for the maintenance and repair or construction of structures required in the operation of these businesses by obtaining authorization under Limitation Order L-86, which is administered by the PAW.

Action was taken by the War Production Board which, upon the recommendation of the Petroleum Administration for War, amended Limitation Order L-86 and Limitation Order L-41.

Under the amendment to Limitation Order L-86, distributors and marketers of liquefied petroleum gas may now obtain materials for the maintenance and repair of structures required in these businesses by using the automatic preference ratings provided in Preference Rating Order P-98-b.

Under the terms of the amendment to L-86, liquefied petroleum gas distributors and marketers who wish to build new structures must apply to the PAW for permission to use materials for this purpose by filing a PAW Form 30. Form 30 should be addressed to the Natural Gas and Natural Gasoline Division, Ref: L-86, Petroleum Administration for War, Interior Bldg., Washington 25, D. C.

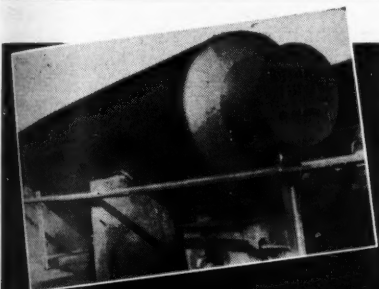
Limitation Order L-41 was amended to eliminate liquefied petroleum gas marketers and distributors from the provisions of that order. This was done to make it clear to operators that they should apply only to PAW for priorities assistance and for permission to build structures required for liquefied petroleum gas operations.

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Many peacetime products and practices are proving extremely valuable for wartime use. One of the earliest and most universal uses of LP-Gases was for welding and heating in factories, on farms and construction projects; for cooking and heating in countless homes.

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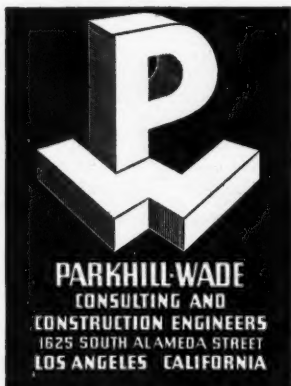
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N-Butane
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ETHYL MERCAPTAN

—Purified—

The **ACCEPTED**
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gases.

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CHEMICAL WORKS**

ST. LOUIS

NEW YORK

South Dakota Oil Men Will Hear About LP-Gas

The South Dakota Independent Oil Men's Association will hold its 26th annual convention at Mitchell, S. D. on Nov. 27-28.

Headline speakers will include R. L. Majewski, director of District No. 2 PAW marketing committee and who is vice president of the Deep Rock Oil Corp.

Walter H. Hoagland, of Fisher Governor Co., Marshalltown, Iowa, will talk on liquefied gases, their uses and possibilities. Mr. Hoagland has been in public utility, industrial, commercial and domestic gas sales for over 15 years. He has had many years experience in the application of liquefied petroleum gases for all types of applications and has erected many bulk plants to handle both butane and propane throughout the United States.

The United States Rubber Co. will present its latest film and will give the latest information on the rubber situation. There will be talks on the various greases and heavy duty detergent motor oils. The film "Oil For Tomorrow" is being furnished by the Interstate Oil Compact Commission. Suitable banquet and entertainment programs have also been arranged.

CNGA Fall Meeting At Los Angeles, Oct. 13

The 19th annual meeting of the California Natural Gasoline Association is scheduled for Oct. 13 at the Biltmore hotel in Los Angeles.

There will be an all-day program of talks on current affairs of interest to association members and the evening will be devoted to a banquet and a specially planned entertainment.

Tickets may be had, as usual, from Geo. L. Tyler, secretary, at 510 W. 6th St., Los Angeles.

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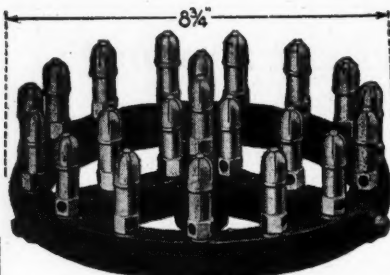
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National Magazines Carry Attractive LP-Gas Ads

Two of the finest publicity "breaks" the LP-Gas industry has had, appeared in recent issues of "Time" and the "Saturday Evening Post" in advertisements featuring Diamond T trucks.

Against a high mountain background appears a Diamond T truck with a Fruehauf trailer, upon which are mounted two butane transport tanks with a total capacity of 8835 gross gallons. These carry in large letters the words, "Bu-Gas—Fannin's." The tanks were manufactured by the American Pipe and Steel Corp., of Alhambra, Calif.

The photo is in the natural colors of the landscape and a half page deep.

The outfit is one purchased last year by the Fannin Gas & Equipment Co., Phoenix, Ariz., and is used for hauling butane from Los Angeles bulk plants to storage in Phoenix. From there the fuel is distributed to Fannin's Arizona dealers.

The transport was purchased to provide a regular fuel supply at a time when rail transportation was so overburdened it could not be depended upon and evidenced the industry trend toward independent ownership of transport facilities. It has proven to be a fast, flexible, economical method of ensuring Fannin outlets with a steady supply of gas.

American Gas Association Convention Called Off

The executive Board of the American Gas Association, acting in response to an urgent request of the Office of Defense Transportation, has voted to cancel the 1944 Annual Convention, scheduled for the Stevens hotel, Chicago, Oct. 5-6.

In compliance with the constitution

UNITED STATES

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A COMPLETE LINE in
size and price range . . .
a heater for every purpose



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LP-GAS ENGINEERING



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Meters and regulators are the tools of the gas engineer. With their aid he harnesses this clean, economical fuel and makes it do his bidding. The wonders of the LPG world of tomorrow are now being "inked in" on designers' drawings the country over. EMCO engineers and research men have served as consultants on many of these projects. EMCO specialized equipment for measurement and control has provided the solution to many a knotty problem.

In the expanding march of the LPG Industry, meters and regulators built by EMCO will continue to be of increasing importance. Their part in the future will be magnified by an ever-growing concept of LPG engineering accomplishments.

PITTSBURGH EQUITABLE METER COMPANY
Pittsburgh 8, Pennsylvania
EMCO Meters and Regulators Control
LPG Application and Usage

Be Ready With
VIKINGS

on **V-DAY**



All-out production for War is still industry's most important job. But it's equally essential that industry plan ahead now to provide maximum profitable employment for our service men and women when they come home after Victory is won.

Adequate preparation should be the **TARGET FOR TODAY** in the battle of the home front. Preparation for the manufacture of Peace-time products, new and old. Development of new machines, improvement of former equipment. In short, preparation that has for its goal providing the greatest number of jobs possible when War contracts are terminated.

Ask Viking about "Rotary Pumps of the Future." Write today for Bulletin 2300 which describes Viking Pumps widely used in the butane-propane industry. **IT'S FREE.**



VIKING PUMP COMPANY
CEDAR FALLS, IOWA

of the Association, an annual meeting will be held Oct. 5 without speaking program and for the transaction of routine business at the Engineering Societies Bldg., New York City.

O. R. Doerr Elected President Of Pacific Coast Gas Assn.

At the 51st annual meeting of the Pacific Coast Gas Association which was held in Los Angeles Sept. 13-14, O. R. Doerr, general sales manager of the Pacific Gas & Electric Co., San Francisco, was elected president for the year 1944-45. He succeeds E. L. Payne.

H. W. Edmund, vice president and general manager of Coast Counties Gas and Electric Co., Santa Cruz, Calif., was named as the new vice

president, and D. G. Martin, general auditor of Pacific Gas & Electric Co. was elected treasurer.

Two-year-term directors for the ensuing year are F. M. Banks, Southern California Gas Co.; R. G. Barnett, Portland Gas & Coke Co.; N. H. Gellert, Seattle Gas Co., and E. T. Howard, General Controls.

Carroll Willis, Wichita, Kan. Resigns WPB Job

The resignation of Carroll Willis, manager of the Wichita, Kan., district office of the War Production Board for the past two years, resigned Sept. 15.

Mr. Willis plans to resume his duties as president of the Home Appliance Co., wholesalers of LP-Gas appliances.

JUST TO CLEAR THE AIR!

We are manufacturers of LPG equipment selling direct to gas dealers.

No wholesale appliance jobbers handle any of our products.

As soon as conditions permit our own qualified representative will call on you. In the meantime, we respectfully solicit your inquiries on—

Above and Below ground LPG systems
Bulk Storage—Truck Tanks—Transports

McNamar Boiler & Tank Co.

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AN AMBITIOUS MAN—EXPERIENCED IN use of LP-Gas, to manage company. Company converting water gas plant to Propane in Middle West county seat town of 5,000 in good agricultural section is looking for a man experienced in handling central station system with mains over entire town as well as servicing and selling appliances on the system and bottle customers. Prefer college educated man between 30 and 50 but appearance, ability and experience will count for book learning. Will start right man at \$200.00 or more a month with per cent of gross or net of total company business also commission on sale of appliances. Essential industry and if you qualify we will assist in WMC release. Write Box 174, Kansas City, Kansas, giving education, experience, references and picture of yourself.

DESIGNING ENGINEER FAMILIAR WITH equipment requirements for the LP-Gas Industry. When applying give full information as to experience, education and acceptable salary. All information will be kept confidential. Box 350, BUTANE-PROPANE News, 1709 W. 8th St., Los Angeles 14, Calif.

LP-GAS ENGINEER WANTS CONNECTION —Ten years' experience domestic, industrial and automotive conversion fields. Go anywhere. Write Box 330, BUTANE-PROPANE NEWS, 1709 W. 8th St., Los Angeles 14, Calif.

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